Service Manual

Model : G1610

LG

Service Manual

G1610

P/N : MMBD0045701

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1.INTRODUCTION

1.1 Purpose

This manual provides the information necessary to repair, calibration, description and download the features of G1610.

1.2 Regulatory Information

A. Security

Toll fraud, the unauthorized use of telecommunications system by an unauthorized part (for example, persons other than your company's employees, agents, subcontractors, or person working on your company's behalf) can result in substantial additional charges for your telecommunications services. System users are responsible for the security of own system. There may be risks of toll fraud associated with your telecommunications system. System users are responsible for programming and configuring the equipment to prevent unauthorized use. The manufacturer does not warrant that this product is immune from the above case but will prevent unauthorized use of common-carrier telecommunication service of facilities accessed through or connected to it. The manufacturer will not be responsible for any charges that are resulted from such unauthorized use.

B. Incidence of Harm

If a telephone company determines that the equipment provided to customer is faulty and possibly causing harm or interruption in service to the telephone network, it should disconnect telephone service until repair can be done. A telephone company may temporarily disconnect service as long as repair is not done.

C. Changes in Service

A local telephone company may make changes in its communications facilities or procedure. If these changes could reasonably be expected to affect the use of this phone or compatibility with the network, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

D. Maintenance Limitations

Maintenance limitations on this model must be performed only by the manufacturer or its authorized agent. Therefore, note that unauthorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

E. Notice of Radiated Emissions

This model complies with rules regarding radiation and radio frequency emission as defined by local regulatory agencies. In accordance with these agencies, you may be required to provide information such as the following to the end user.

F. Pictures

The pictures in this manual are for illustrative purposes only; your actual hardware may look slightly different.

G. Interference and Attenuation

Phone may interfere with sensitive laboratory equipment, medical equipment, etc. Interference from unsuppressed engines or electric motors may cause problems.

H. Electrostatic Sensitive Devices

ATTENTION

Boards, which contain Electrostatic Sensitive Device (ESD), are indicated by the sign. Following information is ESD handling:

Service personnel should ground themselves by using a wrist strap when exchange system boards.

When repairs are made to a system board, they should spread the floor with anti-static mat which is also grounded.

Use a suitable, grounded soldering iron.

Keep sensitive parts in these protective packages until these are used.

When returning system boards or parts like EEPROM to the factory, use the protective package as described.

1.3 Abbreviations

For the purposes of this manual, following abbreviations apply:

APC	Automatic Power Control
BB	Baseband
BER	Bit Error Rate
CC-CV	Constant Current – Constant Voltage
DAC	Digital to Analog Converter
DCS	Digital Communication System
dBm	dB relative to 1 milli watt
DSP	Digital Signal Processing
ESD	Electrostatic Discharge
FPCB	Flexible Printed Circuit Board
GMSK	Gaussian Minimum Shift Keying
GPIB	General Purpose Interface Bus
GSM	Global System for Mobile Communications
IPUI	International Portable User Identity
IF	Intermediate Frequency
LCD	Liquid Crystal Display
LDO	Low Drop Output
LED	Light Emitting Diode
OPLL	Offset Phase Locked Loop
PAM	Power Amplifier Module
PCB	Printed Circuit Board
PGA	Programmable Gain Amplifier
PLL	Phase Locked Loop
PSTN	Public Switched Telephone Network
RF	Radio Frequency
RLR	Receiving Loudness Rating
RMS	Root Mean Square
RTC	Real Time Clock
SAW	Surface Acoustic Wave

SIM	Subscriber Identity Module
SLR	Sending Loudness Rating
SRAM	Static Random Access Memory
PSRAM	Pseudo SRAM
STMR	Side Tone Masking Rating
TA	Travel Adapter
TDD	Time Division Duplex
TDMA	Time Division Multiple Access
UART	Universal Asynchronous Receiver/Transmitter
VCO	Voltage Controlled Oscillator
VCTCXO	Voltage Control Temperature Compensated Crystal Oscillator
WAP	Wireless Application Protocol

2. PERFORMANCE

2.1 H/W Features

Item	Feature	Comment
Standard Battery	Li-ion, 950 mAh Size: 35.00 x 53.45 x 5.7mm Weight: 30.00g	
Stand by Current	Under the minimum current consumption environment (such as paging period 9), the level of standby current is below 4mA.	
Talk time	Up to 3 hours (GSM TX Level 7)	
Stand by time	Up to 200 hours (Paging Period: 9, RSSI: -85 dBm)	
Charging time	3.5 hours	
RX Sensitivity	GSM, EGSM: –105dBm, DCS: –105dBm	
TX output power	GSM, EGSM: 32dBm (Level 5), DCS: 29dBm (Level 0)	
GPRS compatibility	Class 10	
SIM card type	3V Small	
Display	128 x 128 pixel 65K Color	
Status Indicator	Hard icons. Key Pad; 0 ~ 9, #, *, Up/Down/Left/Right Navigation Key, OK key, Confirm key, Clear Key, Back Key, Send Key, END/PWR Key	
ANT	Internal	
EAR Phone Jack	Yes	
PC Synchronization	Yes	
Speech coding	EFR/FR/HR	
Data and Fax	Yes	
Vibrator	Yes	
Loud Speaker	Yes	
Voice Recording	Yes	
C-Mike	Yes	
Receiver	Yes	
Travel Adapter	Yes	
Options	Hands-free kit, CLA, Data Kit	

2.2 Technical Specification

Item	Description	Specification	
5	Output RF Spectrum (due to modulation)	**GSM, EGSM**	
		Offset from Carrier (kHz).	Max. dBc
		100	+0.5
		200	–30
		250	–33
		400	–60
		600~ <1,200	–60
		1,200~ <1,800	–60
		1,800~ <3,000	–63
		3,000~ <6,000	–65
		6,000	–71
		DCS	
		Offset from Carrier (kHz).	Max. dBc
		100	+0.5
		200	–30
		250	–33
		400	–60
		600~ <1,200	–60
		1,200~ <1,800	–60
		1,800~ <3,000	–65
		3,000~ <6,000	–65
		6,000	–73
6	Output RF Spectrum (due to switching transient)	**GSM, EGSM**	
		Offset from Carrier (kHz).	Max. dBm
		400	–19
		600	–21
		1,200	–21
		1,800	–24
		GSM	
		Offset from Carrier (kHz).	Max. dBm
		400	–22
		600	–24
		1,200	–24
		1,800	–27
7	Spurious Emissions	Conduction, Radiation	

2. PERFORMANCE

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		Offset from Carrier (kHz).	Max. dBc
		100	+0.5
		200	–30
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		400	–60
		600~ <1,200	–60
		1,200~ <1,800	–60
		1,800~ <3,000	–63
		3,000~ <6,000	–65
		6,000	–71
		DCS	
		Offset from Carrier (kHz).	Max. dBc
		100	+0.5
		200	–30
		250	–33
		400	–60
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		400	–22
		600	–24
		1,200	–24
		1,800	–27
7	Spurious Emissions	Conduction, Radiation	

Item	Description	Specification		
8	Bit Error Rate	**GSM, EGSM** BER (Class II) < 2.439% @–102 dBm **DCS** BER (Class II) < 2.439% @–100 dBm		
9	RX Level Report Accuracy	±3 dB		
10	SLR	8 ±3 dB		
11	Sending Response	Frequency (Hz)	Max.(dB)	Min.(dB)
		100	–12	–
		200	0	–
		300	0	–12
		1,000	0	–6
		2,000	4	–6
		3,000	4	–6
		3,400	4	–9
		4,000	0	–
12	RLR	2 ±3 dB		
13	Receiving Response	Frequency (Hz)	Max. (dB)	Min. (dB)
		100	–12	–
		200	0	–
		300	2	–7
		500	❊	–5
		1,000	0	–5
		3,000	2	–5
		3,400	2	–10
		4,000	2	
		* Mean that Adopt a straight line in between 300 Hz and 1,000 Hz to be Max. level in the range.		
14	STMR	13±5 dB		
15	Stability Margin	> 6 dB		
16	Sending Distortion	dB to ARL (dB)	Level Ratio (dB)	
		–35	17.5	
		–30	22.5	
		–20	30.7	
		–10	33.3	
		0	33.7	
		7	31.7	
		10	25.5	
17	Side tone Distortion	Three stage distortion < 10%		
18	System frequency (13 MHz) tolerance	≤ 2.5 ppm		
19	32.768KHz tolerance	≤ 30 ppm		

2. PERFORMANCE

Item	Description	Specification	
20	Ringer Volume	At least 80 dB under below conditions: 1. Ringer set as ringer. 2. Test distance set as 50 cm.	
21	Charge Current	CC Charge : < 500 mA Trickle Charge : < 60 mA	
22	Antenna Display	Antenna Bar Number	Power
		5	–85 dBm ~
		4	–90 dBm ~ –86 dBm
		3	–95 dBm ~ –91 dBm
		2	–100 dBm ~ –96 dBm
		1	–105 dBm ~ –101 dBm
		0	~ –105 dBm
23	Battery Indicator	Battery Bar Number	Voltage
		0	~ 3.62V
		1	3.62 ~ 3.73V
		2	3.73 ~ 3.82V
		3	3.82V ~
24	Low Voltage Warning	3.5 ± 0.03V (Standby)	
		3.62 ± 0.03V (Call)	
25	Forced shut down Voltage	3.35 ± 0.03V	
26	Battery Type	1 Li-ion Battery Standard Voltage = 3.7V Battery full charge voltage = 4.2V Capacity : 950mAh	
27	Travel Charger	Switching-mode charger Input : 100 ~ 240V, 50/60 Hz Output : 5.2V, 800 mA	

3. TECHNICAL BRIEF

3.1 Transceiver (SI4205-BM, U401)

The RF parts consist of a transmitter part, a receiver part, a frequency synthesizer part, a voltage supply part, and a VCTCXO part.
The Aero I transceiver is the integrated RF front end for multi-band GSM/GPRS digital cellular handsets and wireless data modems. The integrated solution eliminates the IF SAW filter, external low noise amplifier (LNAs) for three bands, transmit and RF voltage controlled oscillator (VCO modules, and other discrete components found in conventional designs.

Functional Description

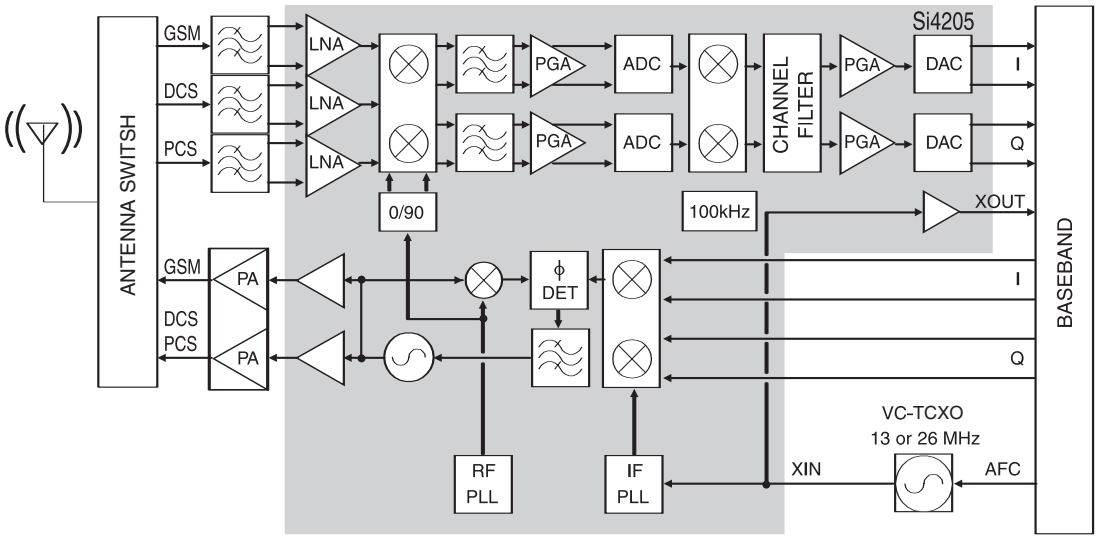


Figure 3-1 Block Diagram of SI4205

(1) Receiver Part

The Aero I transceiver uses a low-IF receiver architecture which allows for the on chip integration of the channel selection filters, eliminating the external RF image reject filters and the IF SAW filter required in conventional superheterodyne architectures.

A. RF front end

RF front end consists of Antenna Switch(FL400), two SAW Filters(FL401, FL402) and dual band LNAs integrated in transceiver (U401).
The Received RF signals(GSM 925MHz ~ 960MHz, DCS 1805MHz ~ 1880MHz) are fed into the antenna or Mobile switch.
The Antenna Switch(FL400) is used to control the Rx and Tx paths. And, the input signals VC1 and VC2 of a FL400 are directly connected to baseband controller to switch either Tx or Rx path on.
The logic and current is given below Table 3-1.

Table 3-1 The Logic and current

	VC1	VC2	Current
DCS TX	0V	2.5 ~ 3.0V	10.0 mA max
GSM TX	2.5 ~ 3.0V	0V	10.0 mA max
GSM/DCS RX	0V	0V	< 0.1 mA

Three differential-input LNAs are integrated in SI4205. The GSM input supports the GSM 850 (869-849 MHz) or E-GSM 900 (925-960MHz) bands. The DCS input supports the DCS 1800 (1805-1880 MHz) band. The PCS input supports the PCS 1900 (1930-1990 MHz) band.

The LNA inputs are matched to the 150ßŸ balanced output SAW filters through external LC matching networks. The LNA gain is controlled with the LNAG[1:0] and LNAC[1:0] bits in register 05h (Figure 3-2).

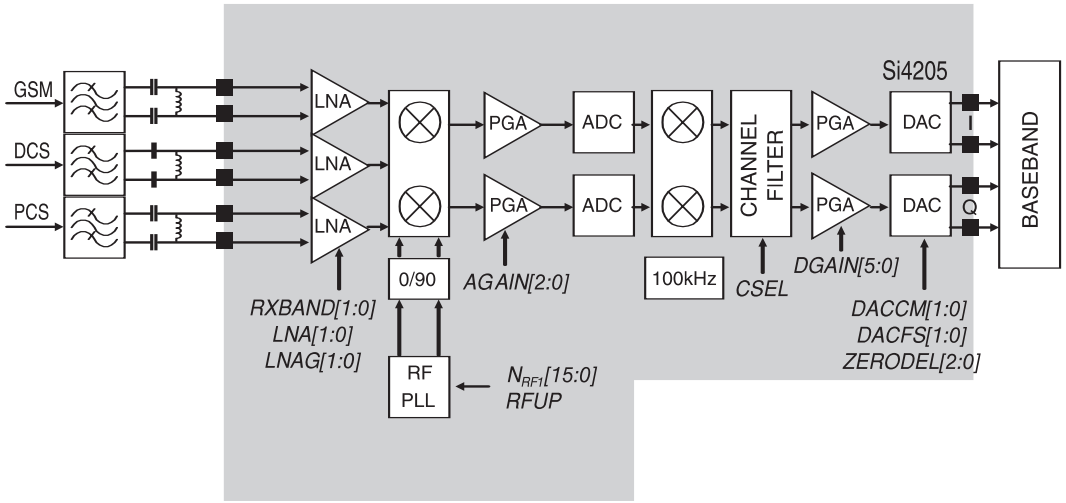


Figure 3-2 Block Diagram of Receiver part of SI4205

B. Intermediate frequency (IF) and Demodulation

A quadrature image-reject mixer downconverts the RF signal to a 100KHz intermediate frequency (IF) with the RFLO from the frequency synthesizer. The RFLO frequency is between 1737.8 to 1989.9 MHz, and is internally divided by 2 for GSM 850 and E-GSM 900 modes. The mixer output is amplified with an analog programmable gain amplifier (PGA), which is controlled with the AGAIN[2:0] bits in register 05h (Figure3-2). The quadrature IF signal is digitized with high resolution A/D converters (ADCs).

The ADC output is downconverted to baseband with a digital 100KHz quadrature LO signal. Digital decimation and IIR filters perform channel selection to remove blocking and reference interference signals. The selectivity setting (CSEL=0) or a low selectivity setting (CSEL=1). The low selectivity filter has a flatter group channelization filter is in the baseband chip. After channel selection, the digital output is scaled with a digital PGA, which is controlled with the DGAIN [5:0] bits in register 05h.

The amplified digital output signal go through with DACs that drive a differential analog signal onto the RXIP,RXIN,RXQP and RXQN pins to interface to standard analog ADC input baseband ICs. No special processing is required in the baseband for offset compensation or extended dynamic range.

Compared to a direct-conversion architecture, the low-IF architecture has a much greater degree of immunity to dc offsets that can arise from RF local oscillator(RFLO) self-mixing, 2nd order distortion of blockers, and device 1/f noise.

(2) Transmitter part

The transmit (Tx) section consists of an I/Q baseband upconverter, and offset phase-locked loop (OPLL) and two output buffers that can drive external power amplifiers (PA), one for the GSM 850 (824-849 MHz) and E-GSM 900 (880-915 MHz) bands and one for the DCS 1800 (1710-1785 MHz) and PCS 1900 (1850-1910MHz) bands.

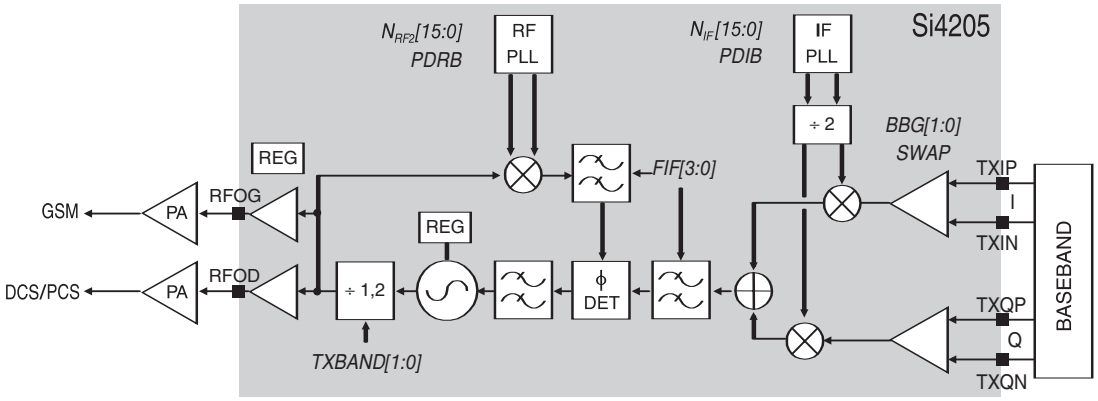


Figure 3-3 Block Diagram of Transmitter part of SI4205

A. IF Modulator

The baseband converter(BBC) within the GSM chipset generates I and Q baseband signals for the Transmit vector modulator. The modulator provides more than 40dBc of carrier and unwanted sideband rejection and produces a GMSK modulated signal.The baseband software is able to cancel out differential DC offsets in the I/Q baseband signals caused by imperfections in the D/A converters.

The Tx-Modulator implements a quadrature modulator. A quadrature mixer upconverts the differential in-phase (TXIP, TXIN) and quadrature (TXQP, TXQN) signals with the IFLO to generate a SSB IF signal that is filtered and used as the reference input to the OPLL.

The IFLO frequency is generated between 766 and 896 MHz and internally divided by 2 to generate the quadrature LO signals for the quadrature modulator, resulting in an IF between 383 and 448 MHz. For the E-GSM 900 band, two different IFLO frequencies are required for spur management. Therefore, the IF PLL must be programmed per channel in the E-GSM 900 band.

B. OPLL

The OPLL consists of a feedback mixer, a phase detector, a loop filter, and a fully integrated TXVCO. The TXVCO is centered between the DCS 1800 and PCS 1900 bands, and its output is divided by 2 for the GSM 850 and E-GSM 900 bands. The RFLO frequency is generated between 1272 and 1483 MHz. To allow a single VCO to be used for the RFLO, high-side injection is used for the GSM 850 and E-GSM 900 bands, and low-side injection is used for the DCS 1800 and PCS 1900 bands. The I and Q signals are automatically swapped when switching bands. Additionally, the SWAP bit in register 03h can be used to manually exchange the I and Q signals. Low-pass filters before the OPLL phase detector reduce the harmonic content of the quadrature modulator and feedback mixer outputs. The cutoff frequency of the filters is programmable with the FIF[3:0] bits in register 04h (Figure 3-3), and should be set to the recommended settings detailed in the register description.

(3) Frequency Synthesizer

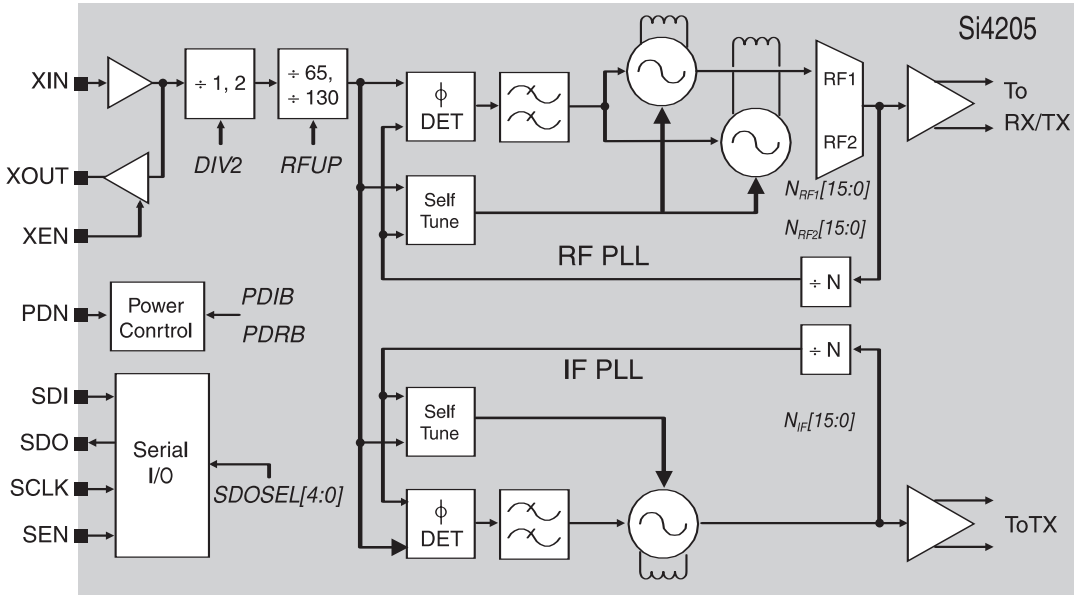


Figure 3-4 Block Diagram of Frequency Synthesizer part of SI4205

The Aero I transceiver integrates two complete PLLs including VCOs, varactors, resonators, loop filters, reference and VCO dividers, and phase detectors. The RF PLL uses two multiplexed VCOs. The RF1 VCO is used for receive mode, and the RF2 VCO is used for transmit mode. The IF PLL is used only during transmit mode. All VCO tuning inductors are also integrated. The IF and RF output frequencies are set by programming the N-Divider registers, NRF1, NRF2 and NIF. Programming the N-Divider register for either RF1 or RF2 automatically selects the proper VCO. The output frequency of each PLL is as follows:

$$f_{out} = N \times f_{\phi}$$

The DIV2 bit in register 31h controls a programmable divider at the XIN pin to allow either a 13 or 26 MHz reference frequency. For receive mode, the RF1 PLL phase detector update rate (f_{ϕ}) should be programmed f_{ϕ} = 100 kHz for DCS 1800 or PCS 1900 bands, and f_{ϕ} = 200 kHz for GSM 850 and E-GSM 900 bands. For transmit mode, the RF2 and IF PLL phase detector update rates are always f_{ϕ} =200 kHz.

3.2 Power Amplifier Module (RF3133, U400)

The RF3133 is a high-power, high-efficiency power amplifier module with integrated power control. The device is self-contained with 50ßŸ input and output terminals. The power control function is also incorporated, eliminating the need for directional couplers, detector diodes, power control ASICs and other power control circuitry;
this allows the module to be driven directly from the DAC output.

The device is designed for use as the final RF amplifier in GSM 850, E-GSM 900, DCS and PCS handheld digital cellular equipment and other applications in the 824-849 MHz, 880-915 MHz, 1710-1785 MHz, and 1850-1910 MHz bands.

On-board power control provides over 37 dB of control range with an analog voltage input (TX_RAMP); and, power down with a logic “low” for standby operation (TX_ENABLE).

External control (BAND_SELECT) is used to select the GSM or DCS band with a logic high or low. A logic low enables the GSM band whereas a logic high enables the DCS band.

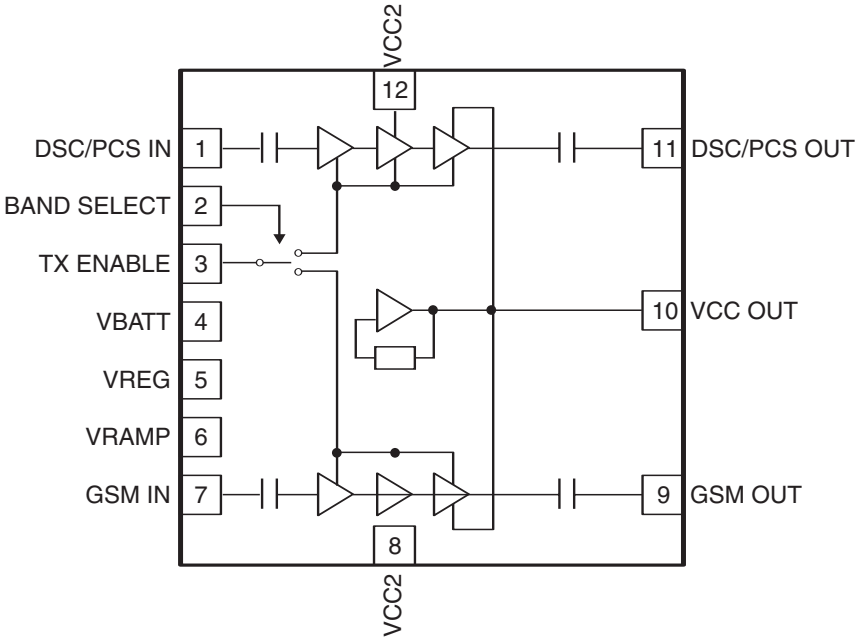


Figure 3-5 Functional Block Diagram of RF3133

3.3 13 MHz Clock

The 13 MHz clock(X400) consists of a TCXO(Temperature Compensated Crystal Oscillator) which oscillates at a frequency of 13 MHz. It is used within the Si4205, analog base band chipset (U101, AD6521), digital base band chipset (U100, AD6525), and MIDI (U200) chipset.

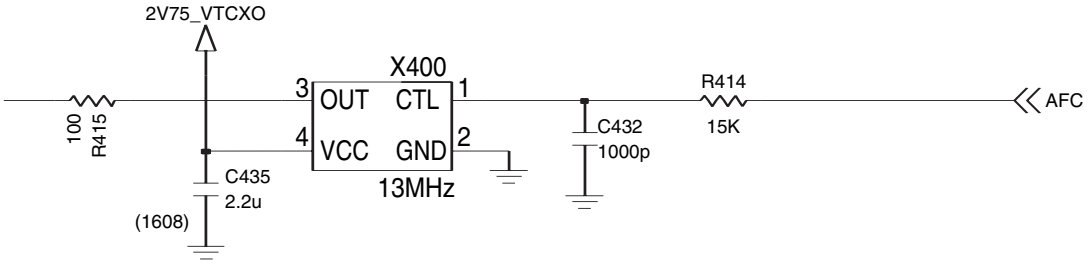


Figure 3-6 VCTCXO circuit diagram

3.4 Power Supplies for RF Circuits

Two regulators are used for RF circuits. One is MIC5255 (U402), and the other is one port of ADP3522 (U301).
MIC5255 (U402) supplies power to transceiver (SI4205, U401).
One port of ADP3522 supplies power to VCTCXO (X400).
Main power (VBAT) from battery is used for PAM (RF3133, U400) because PAM requires high power.

Table 3-2 Power suppliers for RF circuits.

Supplier	Voltage	Powers	Enabled signal
U402	2.85V	U401	RF_EN
U301	2.75V	X400	
Battery	3.4~4.2V	U400	

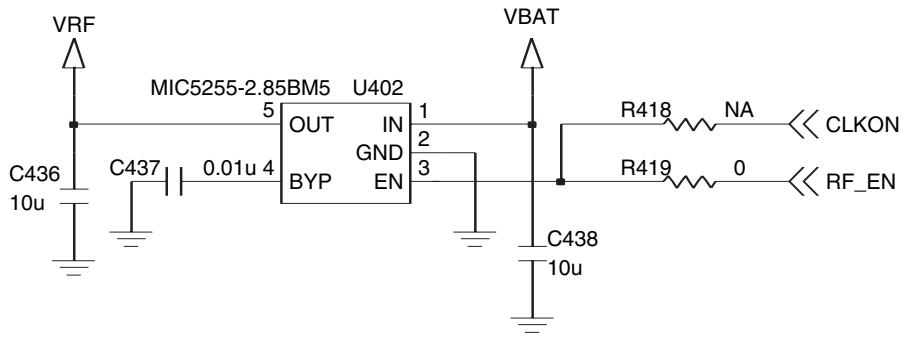


Figure 3-7 U402 circuit diagram

3.5 Digital Main Processor (AD6525, U100)

(1) Architecture Overview

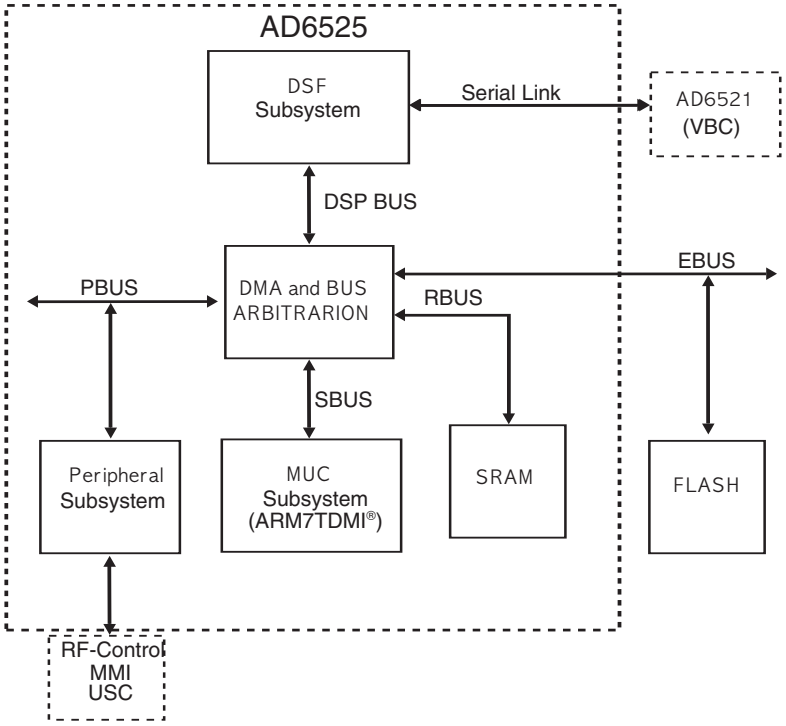


Figure 3-8 Block Diagram of the AD6525 Internal Architecture

The internal architecture of AD6525 is shown in Figure 3-8. AD6525 regroups three main subsystems connected together through a dynamic and flexible communication bys network. It also includes onboard system RAM (SRAM) and interfaces with external Flash Memory, Baseband converter functions, and terminal functions like MMI, SIM and Universal System Connector (USC).

The Digital Signal Processing (DSP) subsystem primarily hosts all the speech processing, channel equalization and channel codec functions. The code used to implement such functions can be stored in external Flash Memory and dynamically downloaded on demand into the DSP's program RAM and Instruction Cache.
The microcontroller subsystem supports all the GSM terminal software, including the layer 1, 2 and 3 of the GSM protocol stack, the MMI, and applications software such as data services, test and maintenance. It is tightly associated with onchip system SRAM and also includes boot ROM memory with a small dedicated routine to facilitate the initialization of the external Flash Memory via code download using the on-chip serial interface to the external Flash Memory interface.

The peripheral subsystem is composed of system peripherals such as interrupt controller, real time clock, watch dog timer, power management and a timing and control module. It also includes peripheral interfaces to the terminal functions:
keyboard, battery supervision, radio and display. Both the DSP and the MCU can access the peripheral subsystem via the peripheral bus (PBUS).

For program and data storage, both the MCU subsystem and the DSP subsystem can access the on chip system SRAM and external memory such Flash Memory.The access to the SRAM module is made through the RAM Bus (RBUS) under the control of the bus arbitration logic. Similarly, access to the Flash Memory is through the
parallel External Bus (EBUS).

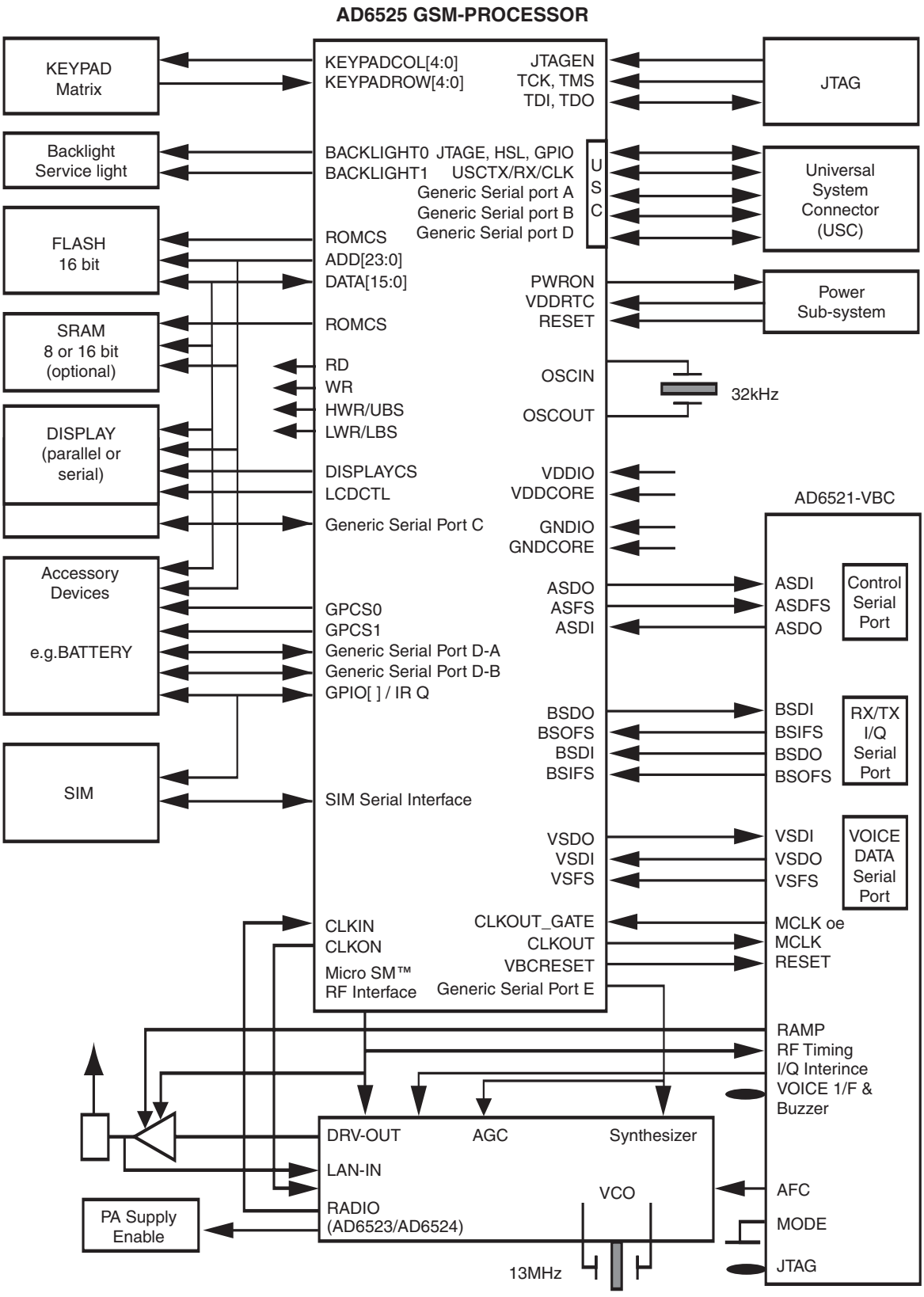


Figure 3-9 Example of System Interconnection of AD6525 External Interfaces

(2) Interconnection with external devices

A. RTC Block Interface

Countered by external crystal oscillator (MC-146, X100).
The X-tal oscillates 32.768 KHz.

B. LCD Module Interface

Controlled by LCD_CS, LCD_RES, ADD1, WR, DATA[0:15], LCD_DIM, and LCD_ID.

Table 3-3 LCD module interface

	Description
LCD_CS	LCD driver chip enable. LCD driver IC has own CS pin
LCD_RES	This pin resets LCD module.
ADD1	This pin determines whether the data to LCD module are display data or control data. ADD1 can select 16 bit parallel bus. ADD1 is also used to address flash memory.
WR	Write control.
DATA[0:15]	Parallel data lines. Color LCD driver chip uses the 16 bit data interface.
LCD_DIM	Control signal for white LED (LCD backlight) driver IC.
LCD_ID	Reserved for future use.

C. RF Interface

The AD6525 control RF parts through RF_EN, ANT_SW1/2, PA_EN, PA_BAND, PDNB,S_EN, S_DATA, AND S_CLK.

Table 3-4 RF interface

GPO	Signal Name	Description
4	RF_EN	RF Enable/Disable
9	ANT_SW1	Antenna Switch Band Select
11	ANT_SW2	Antenna Switch Band Select
16	PA_EN	PAM Enable/Disable
17	PA_BAND	PAM Band Select
18	PDNB	Power Down Input
19	S_EN	Serial Enable Input
20	S_DATA	Serial Data Input
21	S_CLK	Serial Clock Input

D. SIM Interface

The AD6525 check status periodically in call mode if SIM card is inserted or not, but the AD6525 don't check in deep sleep mode.
Interface signals are SIM_DATAOP, SIM_CLK, SIM_RST, SIM_EN

Table 3-5 SIM interface

	Description
SIM_DATAOP	This pin receives and sends data to SIM card. This model support 3.0 volt interface SIM card.
SIM_CLK	Clock 3.25 MHz frequency.
SIM_RST	Reset SIM Block
SIM_EN	Enable SIM Block

E. Key Interface

Key Interface includes 5 column (KEYCOL[0:4]) and 5 row (KEYROW[0:4]). AD6525 detects key press by interrupt.

F. ADP3522(PMIC, U301) Interface

There are 4 signals for PMIC (power management IC) interface.

Table 3-6 PMIC interface

	Description
CHRDET	The pin is activated when charger is inserted.
CHG_EN	Enable charging
EOC	The pin is activated by PMIC whenVBAT reaches 4.2V.
GATE_EN	Control signal from AD6525 to charge NiMH battery. Not used.

3.6 Analog Main Processor (AD6521, U101)

(1) Block Diagram

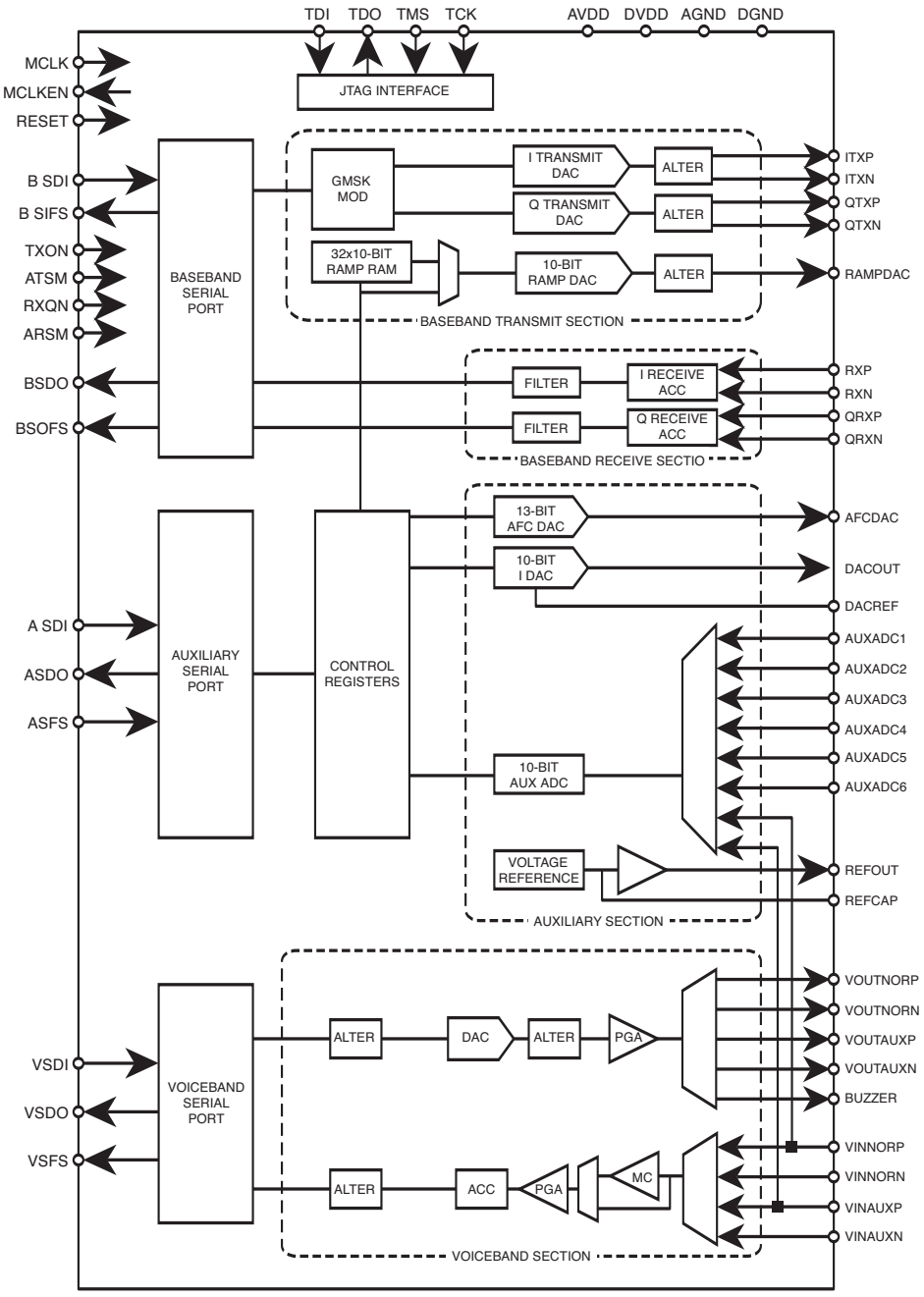


Figure 3-10 Functional Block Diagram of AD6521

(2) BB Transmit Section

This section generates in-phase and quadrature BB modulated GMSK signals (BT = 0.3) in accordance with GSM 05.05 Phase 2 specifications.
The transmit channel consists of a digital GMSK modulator, a matched pair of 10-bit DACs and a matched pair of reconstruction filter.
There are TXIP, TXIN, TXQP, TXQN, and RAMPDAC.

(3) BB Receiver Section

This section consists of two identical ADC channels that process baseband in-phase(I) and quadrature(Q) input signals.
Each channel consists of a coarse switched capacitor input filter, followed by a high-order sigma-delta modulator and a lowpass digital filter.
There are RXIP, RXIN, RXQP, and RXQN.

(4) Auxiliary Section

This section contains two auxiliary DACs(AFC DAC, IDAC) for system control.
This section also contains AUX ADC and Voltage Reference
AUX ADC : 6 channel 10 bits
AFC DAC : 13 bits
IDAC : 10 bits

(5) Voiceband Section

Receive audio signal from MIC. The phones use differential configuration.
Send audio signal to Receiver. The phones use differential configuration.
It interconnects external devices such as main microphone, main receiver, ear-phone and Hands free kit through the VINNORP, VINNORN, VOUTNORP, VOUTNORN, VINAUXP, VINAUXN, VOUTAUXP, and VOUTAUXN
VINNORP, VINNORN: Main MIC positive/negative terminal.
VOUTNORP, VOUTNORN: Main Receiver positive/negative terminal.
VINAUXP, VINAUXN: Hands free kit microphone positive/negative terminal.
VOUTAUXP, VOUTAUXON: Hands free kit speaker positive/negative terminal.

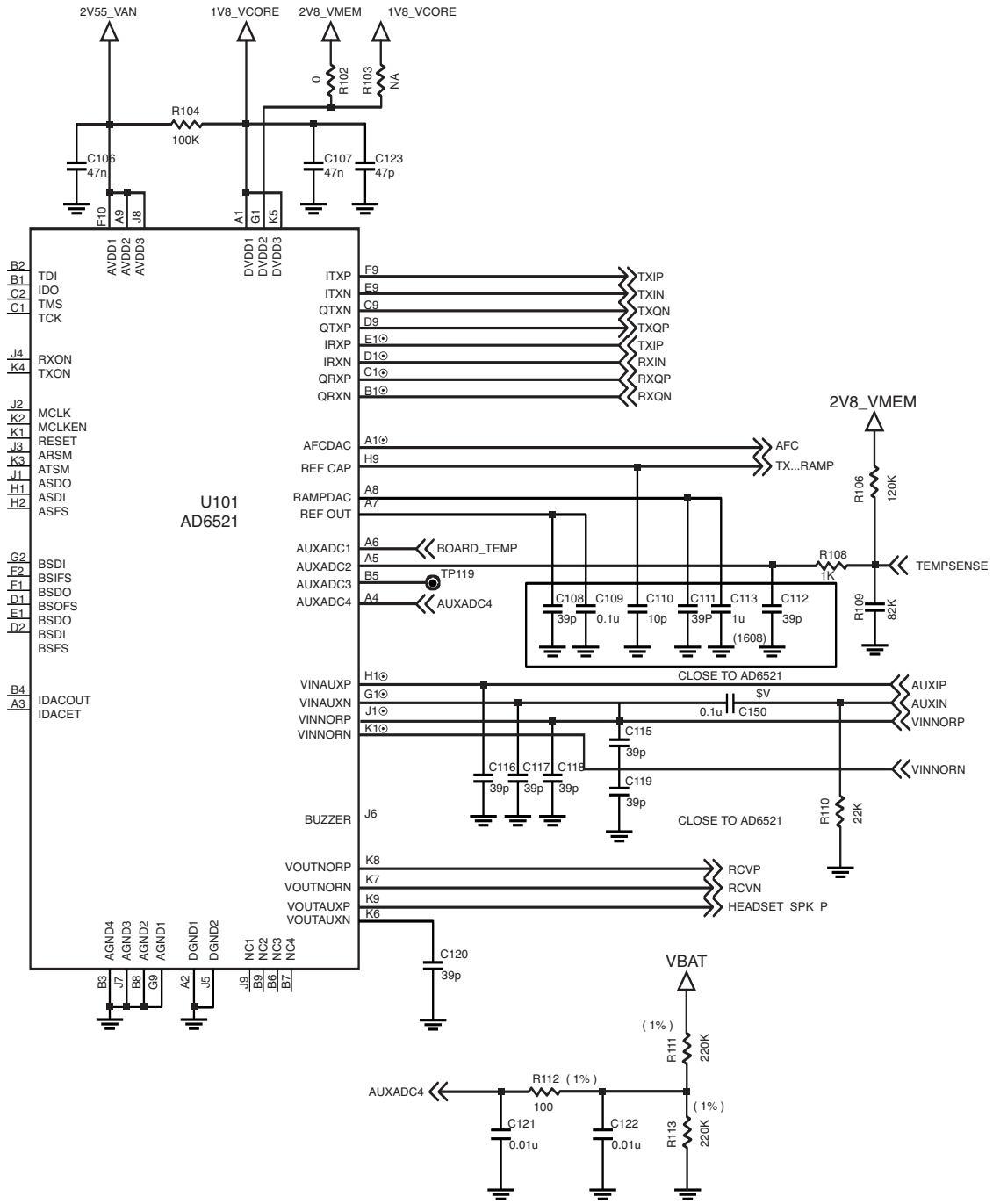


Figure 3-11 Circuit Diagram of AD6521

3.7 Power Management IC (ADP3522, U301)

Block Diagram

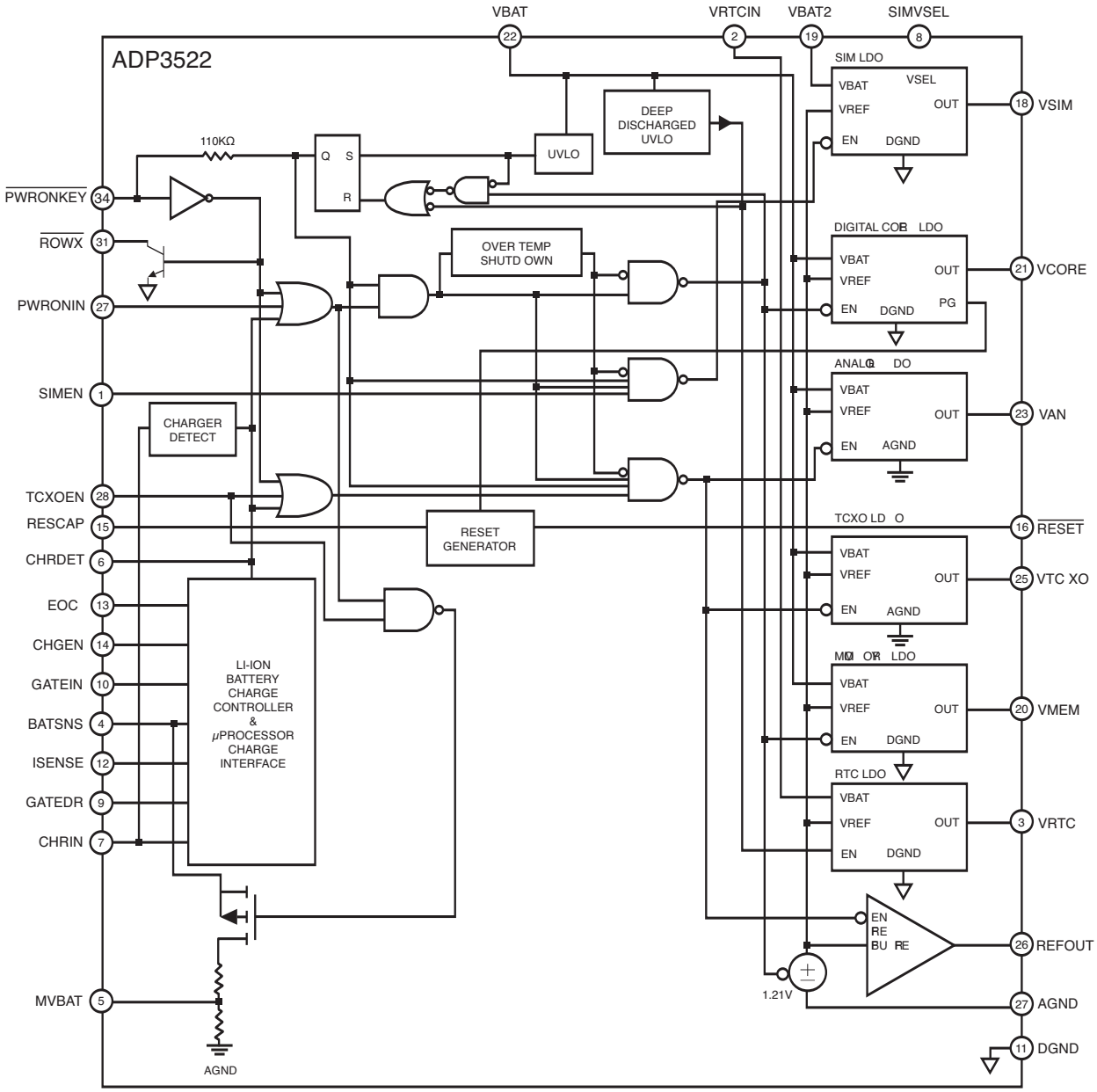


Figure 3-12 Block Diagram of ADP3522

Table 3-7 LDOs of ADP3522

	Description
VSIM	2.85V(is provided to SIM card)
VCORE	1.8V(is provided to the AD6525 & AD6521's digital core)
VRTC	2.0V(is provided to the RTC and Backup Battery)
VAN	2.55V(is provided to the AD6521 I/O and used as microphone bias)
VTCXO	2.75V(is provided to VCTCXO)
VMEM	2.8V(is provided to Flash)

Power on sequence

If a battery is inserted, the battery powers the 6 LDOs.
Then if PWRONKEY is detected, the LDOs output turn on.
REFOUT is also enabled, Reset signal is generated and send to the AD6525.

LDO block

There are 6 LDOs in the ADP3522.

Charging Process

1. Check charger is inserted or not.
2. If ADP3522 detects that Charger is inserted, the CC-CV charging starts.
3. Exception: When battery voltage is lower than 3.2V, the trickle charge (low current charge mode) starts firstly. After the battery voltage reaches to 3.2V, the CC-CV charging starts.

Battery charging block

It can be used to charge Lithium Ion and/or Nickel Metal Hydride batteries. The phones use Li-Ion battery only. Charger initialization, trickle charging, and constant current charging are implemented in hardware.

Pins used for charging

CHGDET : Interrupt to AD6525 when charger is plugged.
CHG_EN : Control signal from AD6525 to charge battery.
EOC : Interrupt to AD6525 when battery is fully charged.
GATE_EN : Control signal from AD6525 to charge NiMH battery. But, not used.

TA (Travel Adaptor)

Input voltage : AC 110V ~ 240V, 50~60Hz
Output voltage : DC 5.2V(+_ 0.2 V)
Output current : Max 800mA

Battery

Li-ion battery : Max 4.2V, Nom 3.7V
Standard battery : Capacity - 950mAh, Li-ion

3.8 Memory (U300)

The memory is consists of 128Mbit Nor Flash Memory and 32Mbit Pseudo SRAM. It has 16 bit parallel data bus and 22 bit address.
Software, RF calibration data, audio parameters and battery calibration data are stored in the Flash memory.

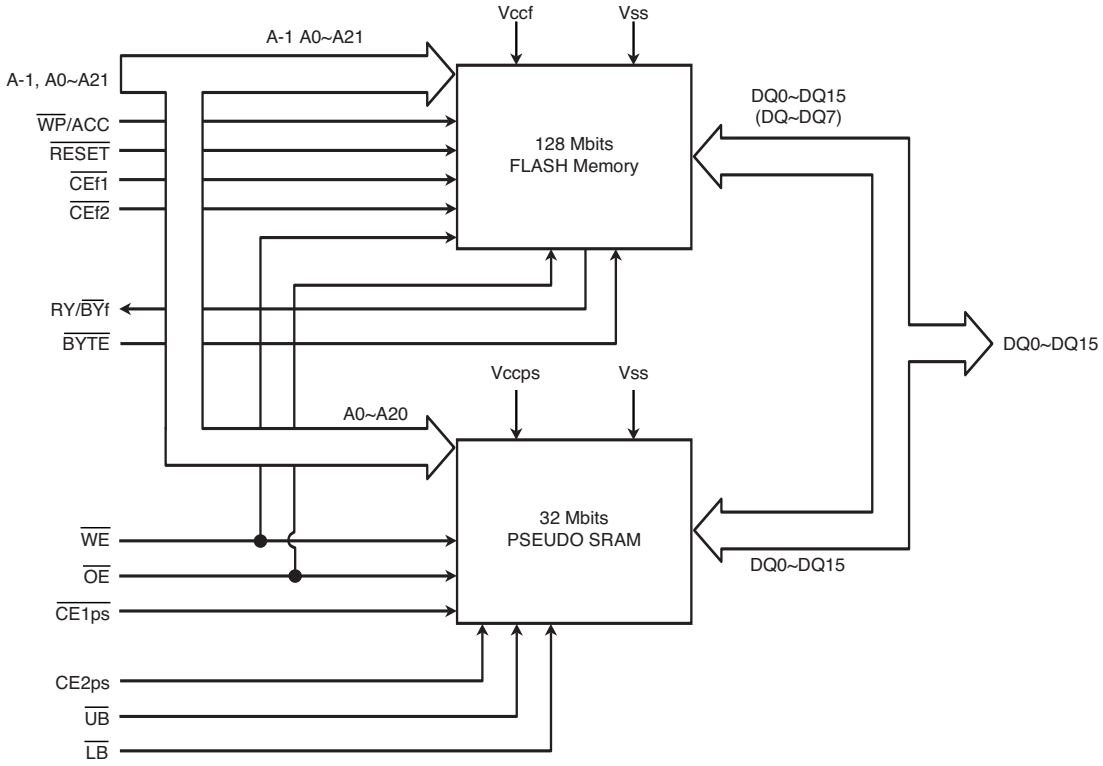


Figure 3-13 Block Diagram of Memory

Figure 3-8 Pin Description of U300

A-1, A0 to A21	Address inputs
DQ0 to DQ15	Data inputs / outputs
$\overline{CE1ps}$, CE2ps	Chip enable inputs for Pseudo SRAM
$\overline{CEf1}$, $\overline{CEf2}$	Chip enable inputs for Nor Flash Memory
$\overline{OE}$	Output enable input
$\overline{WE}$	Write enable input
$\overline{LB}$, $\overline{UB}$	Data byte control inputs for Pseudo SRAM
$\overline{WP}$/ACC	Write protect /program acceleration input Nor Flash Memory
$\overline{RESET}$	Hardware reset input for Nor Flash Memory
$\overline{BYTE}$	Word/Byte select input for Nor Flash Memory
RY/$\overline{BY}$ f	Ready/Busy output for Nor Flash Memory
Vccps	Power supply for Pseudo SRAM
Vccf	Power supply for Nor Flash MemoryPseudo SRAM
Vss	Ground
DU	Don't use
NC	Not connected

3.9 LCD and LCD Backlight

(1) LCD Features

Display Mode : Transmissive 65K Color STN LCD
Color Depth : 32(Red) * 64(Green) * 32(Blue) = 65K Color
Resolution : 128 * RGB * 128 dots for Color display
Interface : 80-series MPU interface
Data bus : 16 bit Parallel interface
Duty ratio : 1/96 Duty for Color display
Viewing Direction : 12 o'clock
LCD Driver : S6B33B2 by SEC
Display RAM capacity : 132 x 16 x 162 = 342.144K bits for Color display

Control Signal is explained in Table 3-3.

(2) LCD Backlight

For LCD backlight illumination, there is a driver (U600) which is driven by LCD_DIM signal from AD6525. Power for the driver is supplied by VBAT.

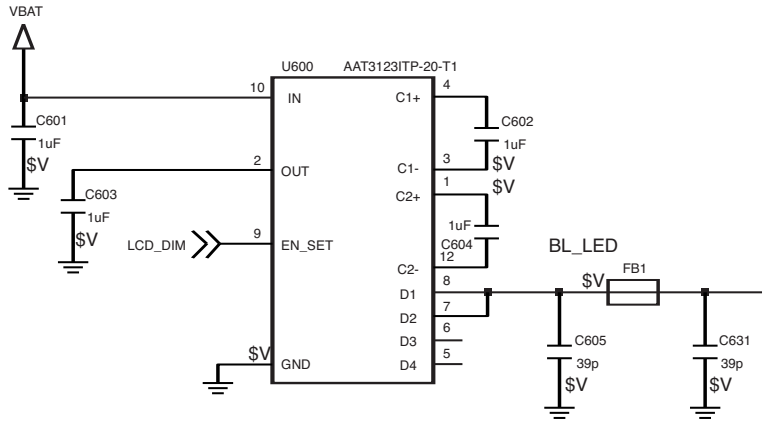


Figure 3-14 Circuit Diagram of Driver IC for LCD backlight

3.10 Keypad Switches and Key Backlight Illumination

(1) Keypad Switches

The key switches are metal domes, which make contact between two concentric pads on the keypad layer of the PCB when pressed. There are 21 switches (KB500-KB522), connected in a matrix of 5 rows by 5 columns, as shown in Figure, except for the power switch (KB500), which is connected independently. Functions, the row and column lines of the keypad are connected to ports of AD6525. The columns are outputs, while the rows are inputs and have pull-up resistors built in. When a key is pressed, the corresponding row and column are connected together, causing the row input to go low and generate an interrupt. The columns/rows are then scanned by AD6525 to identify the pressed key.

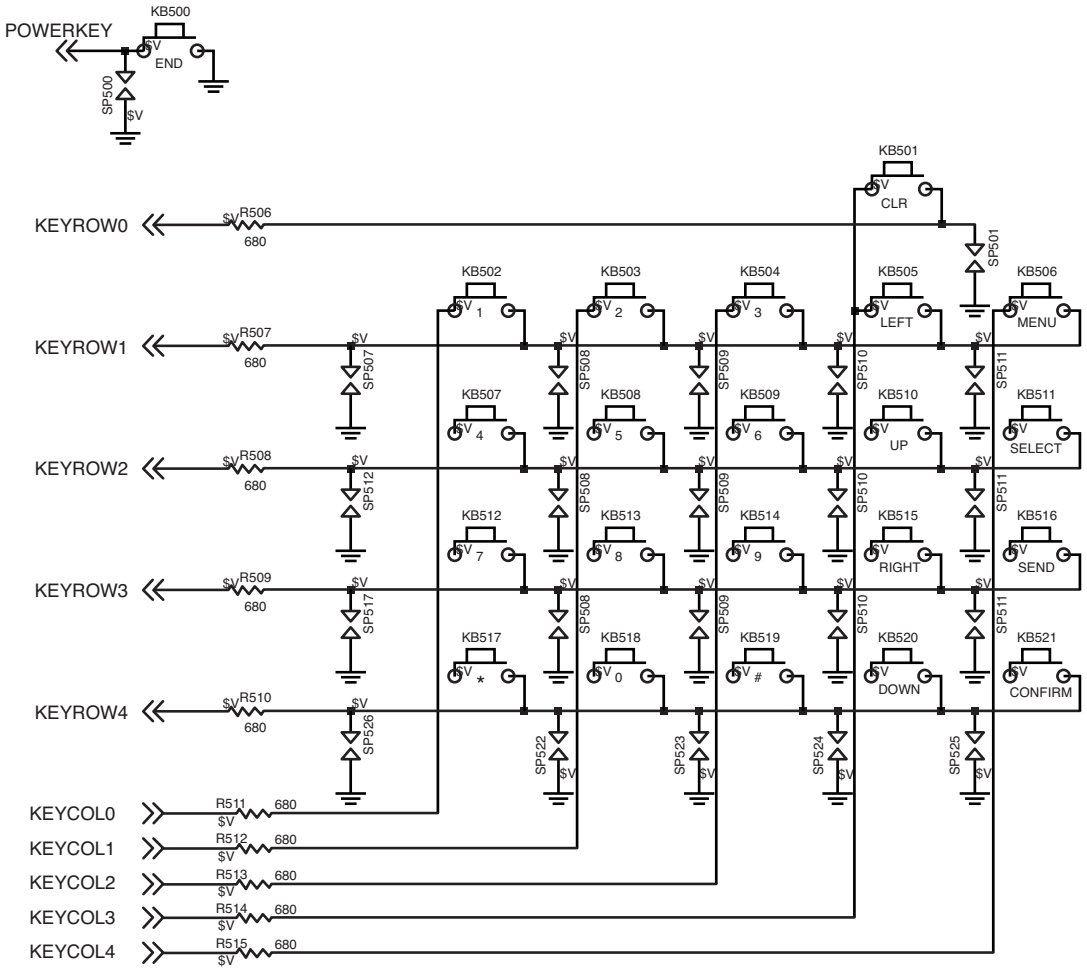


Figure 3-15 Circuit Diagram of Keypad Switches

(2) Key Backlight Illumination

There are 6 blue LEDs for key backlight illumination which are driven by KEY_BACKLIGHT signal from AD6525.

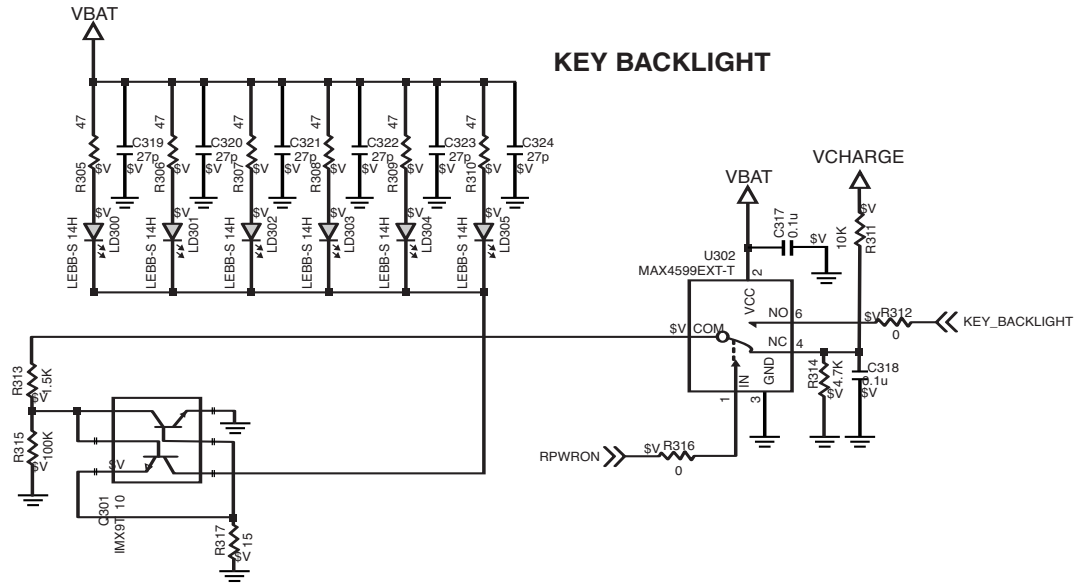


Figure 3-16 Circuit Diagram of key backlight illumination

3.11 Microphone

The microphone is placed to the front cover and is connected to main PCB. The audio signal is passed to VINNORP and VINNORN pins of **AD6521**. The voltage supply 2V55_VAN is output from ADP3522, and is a bias voltage for the VINNORP.
The VINNORP and VINNORN signals are A/D converted by the Voiceband ADC part of AD6521. The digitized speech is then passed to the DSP section of AD6525 for processing (coding, interleaving etc).

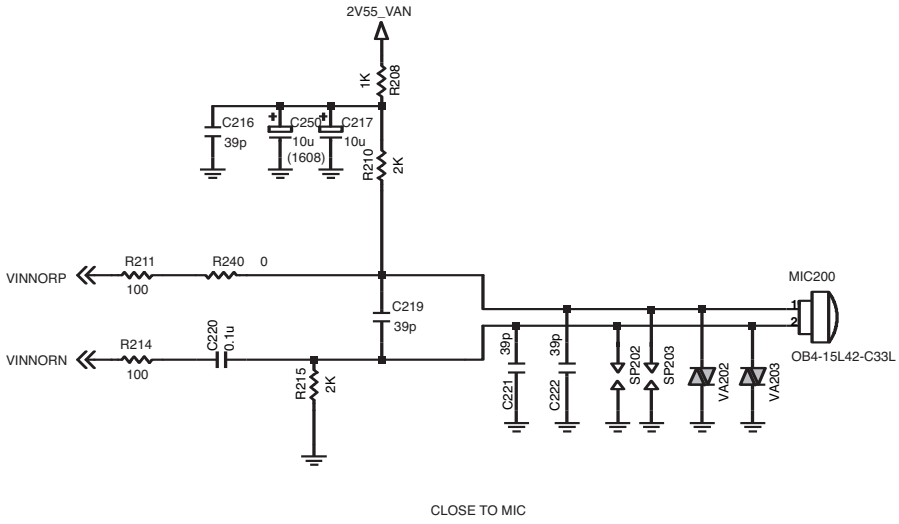


Figure 3-17 Circuit Diagram of Microphone

3.12 Dual Mode Speaker and MIDI IC

(1) Dual Mode Speaker

There is a control signal (SPK_RCV_EN) which is for enabling receiver or speaker because one dual mode speaker is used for both receiver and speaker. The signal is produced by AD6525 and controls the analog switch (U201).
The dual mode speaker is placed in the front cover and contacted to PCB.

A. Receiver Operation

The dual mode speaker is driven by VOUTNORP and VOUTNORN of AD6521 through a analog switch (U201) when it is used for receiver. The gain is controlled by the PGA in AD6521.

B. Speaker Operation

The dual mode speaker is driven by SPOUT1 and SPOUT2 of YMU759B (U200) through the analog switch (U201) when it is used for loud speaker.

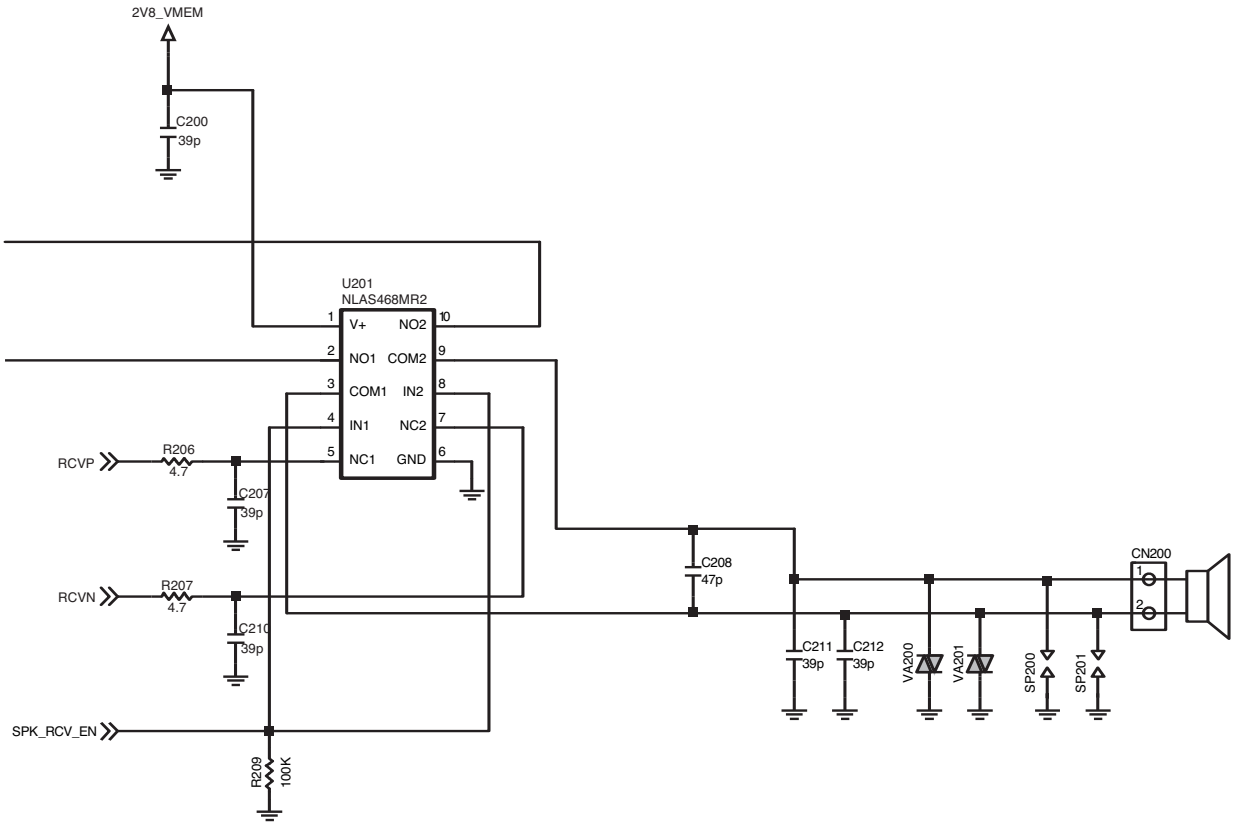


Figure 3-18 Circuit Diagram pf Dual Mode Speaker

(2) MIDI IC (YMU759B, U200)

The phone uses melody IC which makes the robust joyful melody sounds.
6 signals (MIDI_RST, ADD0, RD, MIDI_CS, WR, MIDI_INT) from AD6525 are used to control the melody IC.
Melody data (DATA[8:15]) is transferred to melody IC and played by the dual mode speaker.
External 3.3V LDO (U202) is used for the MIDI chip because the maximum output current of analog amplifier in melody IC is 300mA.

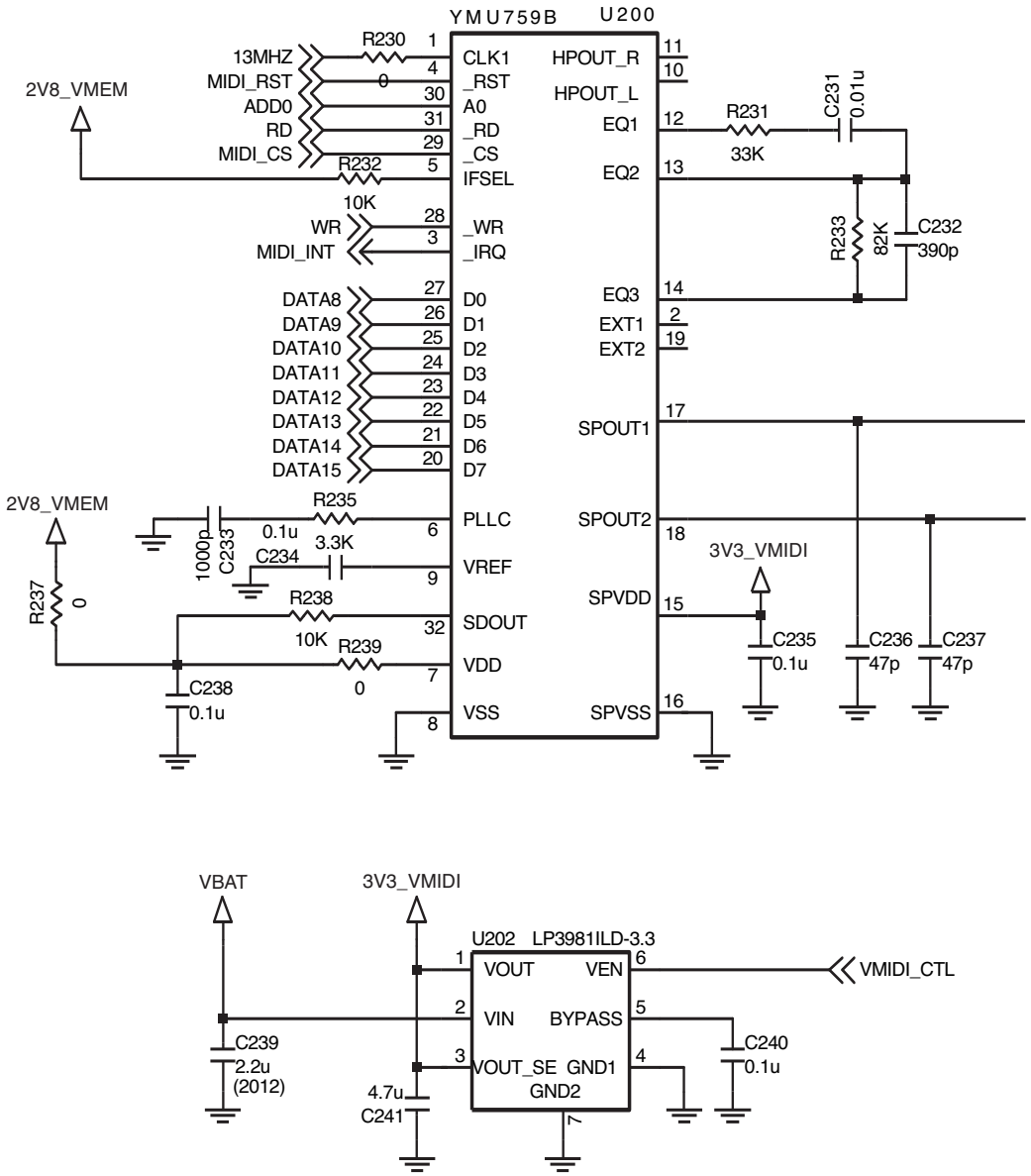


Figure 3-19 Circuit Diagram of MIDI-IC and external LDO

3.13 Headset Jack Interface

3-pole type ear-mic jack which has three electrodes such as Receiver+, Mic+, and GND. This type usually supports only single-ended configuration (VOUTAUXP for headset speaker and VINAUXP for headset mic) in the audio path.

There are two control signals for jack interface. One is JACK_DETECT which is for detecting the headset jack and the other is HOOK_DETECT which is enabled when hook of the headset is pressed. The pins (JACK_DETECT and HOOK_DETECT) interfaces with AD6525.

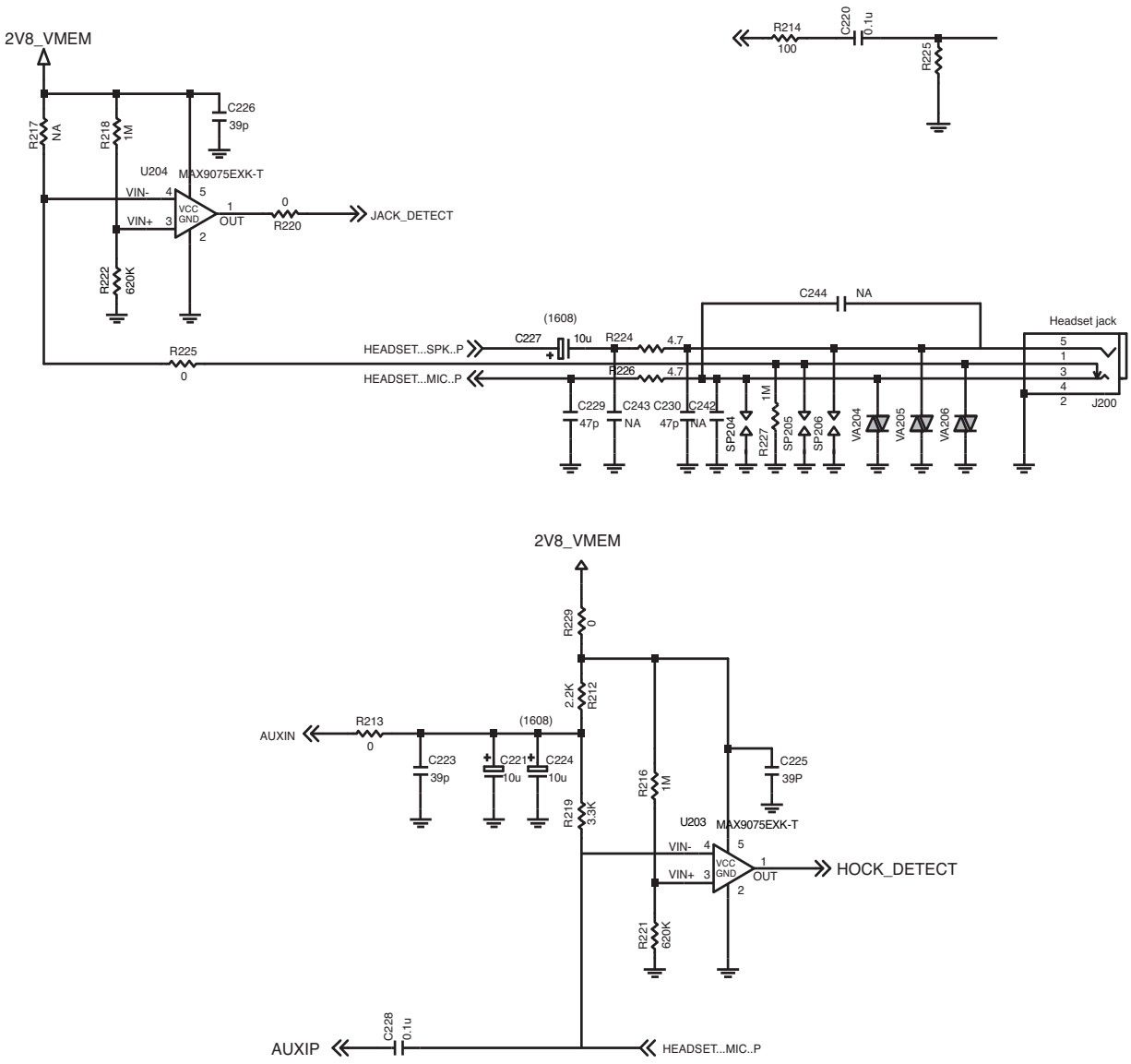


Figure 3-20 Circuit Diagram of Headset Interface

3.14 Bluetooth Section Description

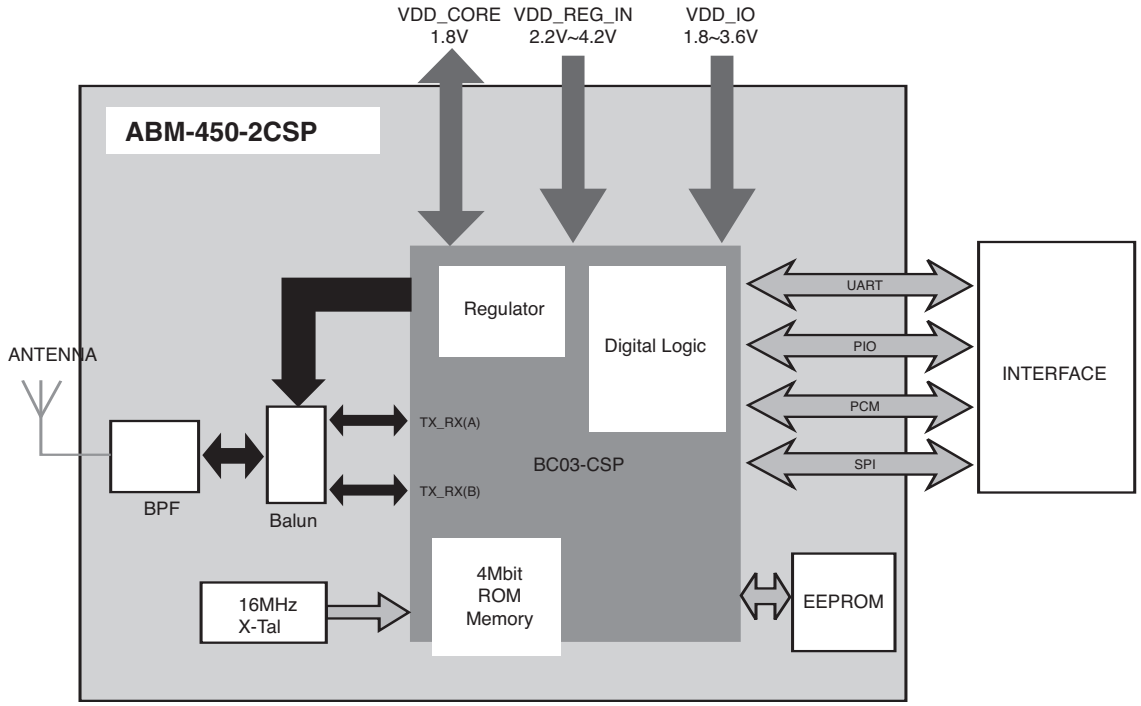


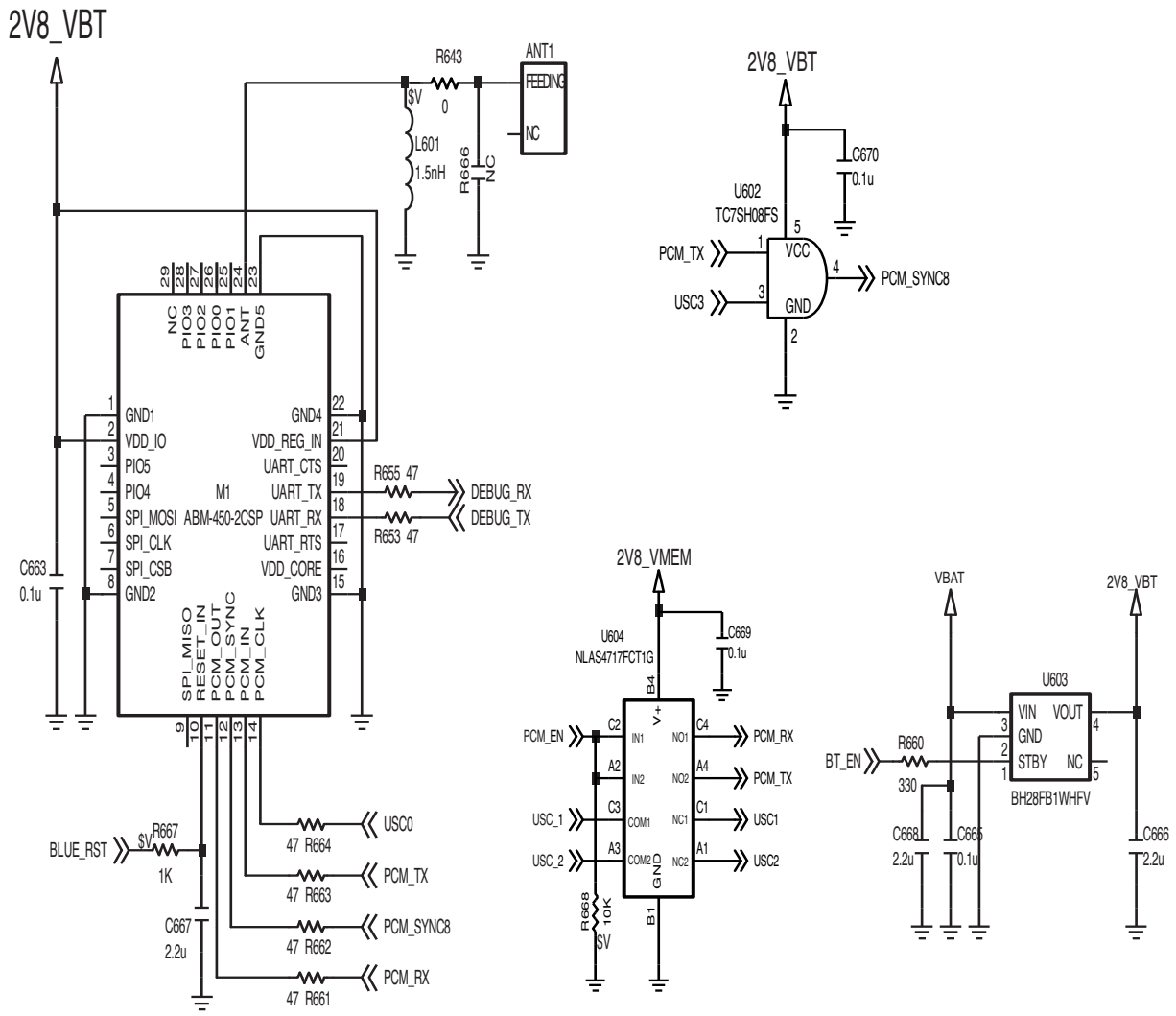
Figure 3-21 Bluetooth Module Block Diagram

1. General description

ARM-450-2CSP(M1) is a Bluetooth module. The Bluetooth system consists of a radio section and a baseband link control section. It consists of Bluetooth Transceiver chip, a EEPROM, a X-tal, a Balun and a band pass filter. And it is surface mountable type for mobile applications. It provides fully compliant Bluetooth system for data and voice communications. Physical interface to host UART can support full Bluetooth data rate 723.2k/57.6kbps. A-Law, μ-Law,13bit or 16bit linear PCM, 8k sample/sec synchronous bidirectional audio interface is available.
Bluetooth section has a chip antenna (ANT1)

2. Bluetooth chip (transceiver)

BC03-CSP is a single chip radio and baseband chip for Bluetooth wireless technology 2.4GHz system. Supports power class 2 radios without the need for an external power amplifier or Tx/Rx switch. The transmitter up-converts the baseband information to the frequency-modulated carrier. Frequency hopping and bursting are performed at this level. For transmission, these range from direct VCO Modulation to IQ mixing at the final RF. In the receiver, a conventional frequency discriminator or IQ down-conversion combined with analog-to–digital conversion is consisted



1. General description

ABM-450-2CSP(M1) : bluetooth module
NLAS4717FCT1(U601) : Analog switch for control signal switching.
BH28FB1WHFV(U603) : provide power for bluetooth block.
TC7SH08FS(U602) : PCM Sync Clock rate converter for bluetooth clock. (to 8kHz)

2. Specification

- -Bluetooth™ V1.1 or 1.2Compliant
- -Transmit Power +4dBm(Class2)
- -1.8V to 3.6V I/O Operation
- -Full Bluetooth data rate over UART
- -Dual UART Port Support
- -Ultra low power consumption

4.1 RF Components

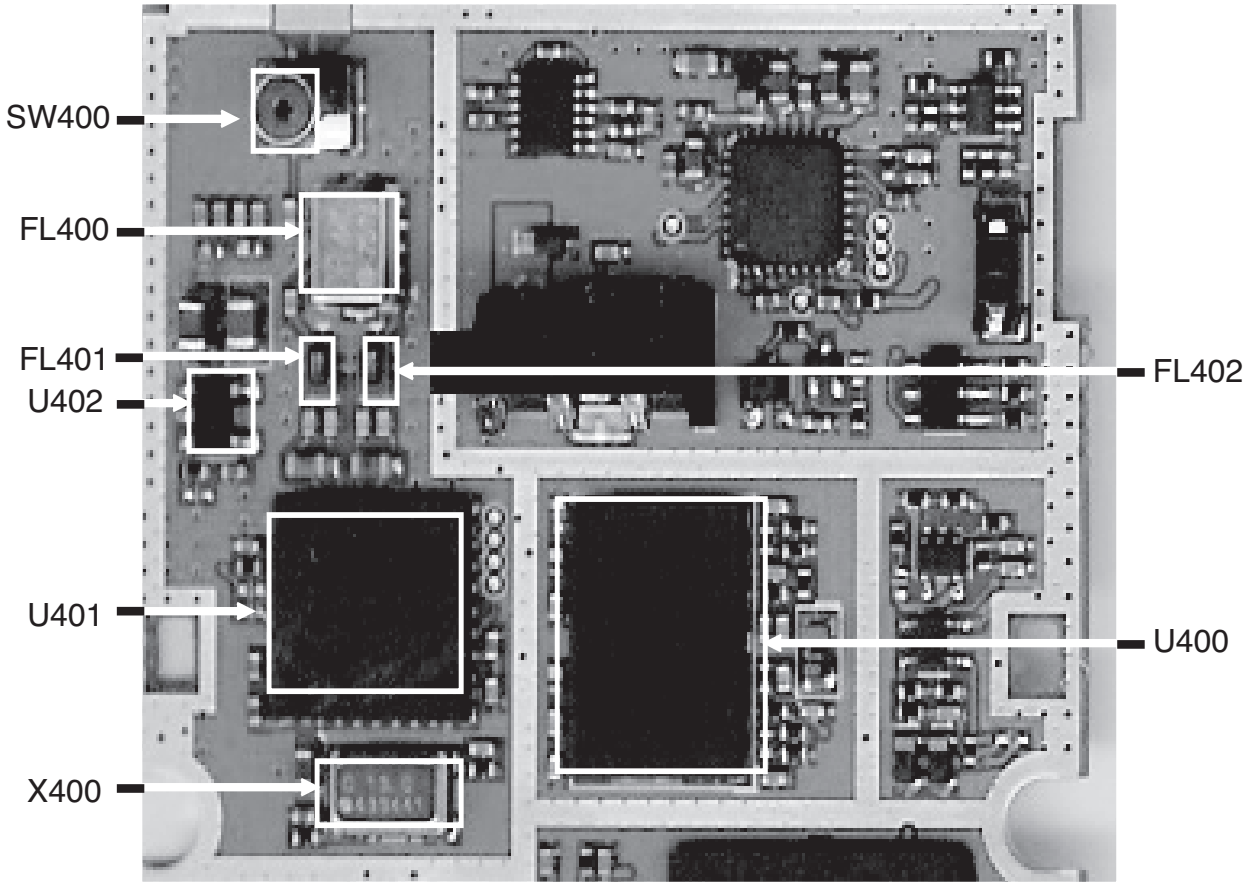
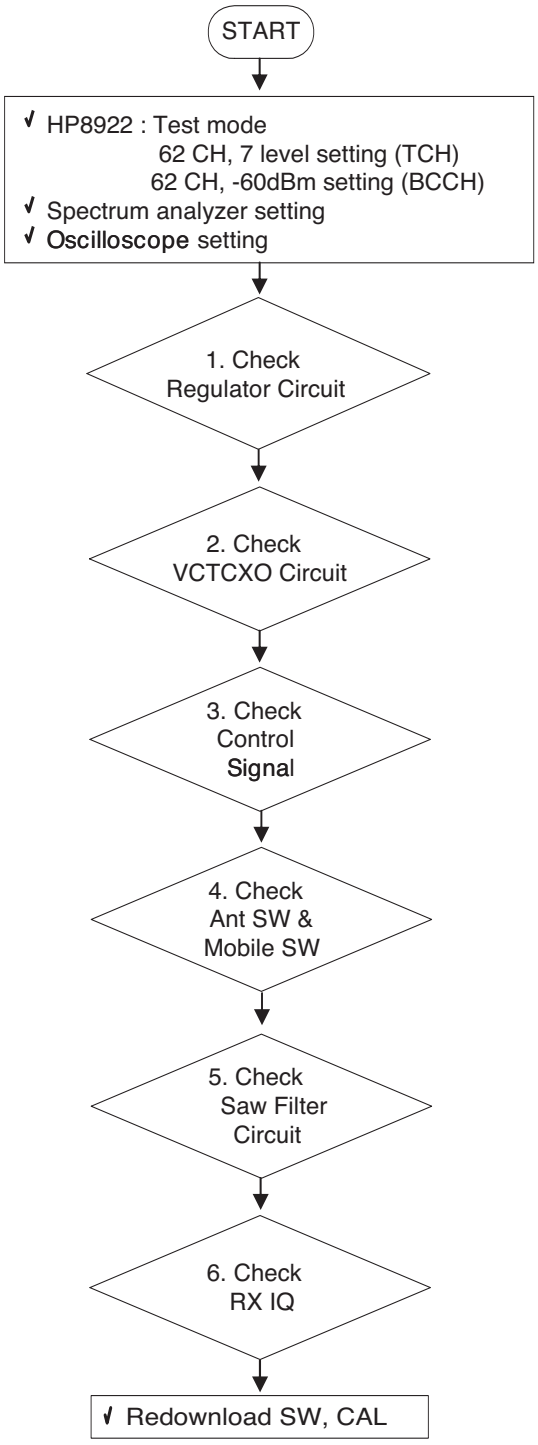


Figure 4-1

Table 4-1

Reference	Description	Reference	Description
SW400	Mobile Switch	U400	Power Amplifier Module
FL400	Antenna Switch	U401	Transceiver
FL401	Saw Filter for GSM	U402	LDO
FL402	Saw Filter for DCS	X400	VCTCXO

4.2 RX Trouble



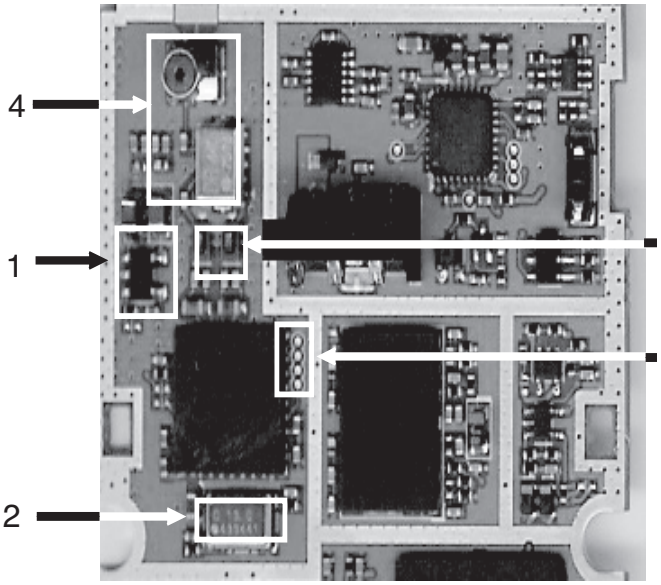


Figure 4-2

4.2.1 Checking Regulator Circuit

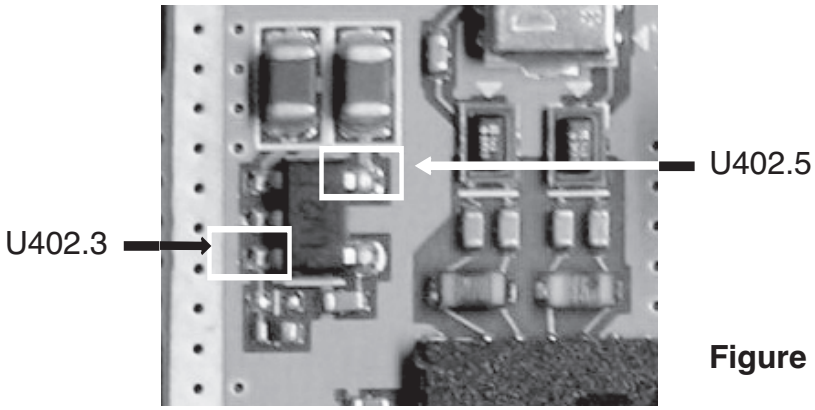
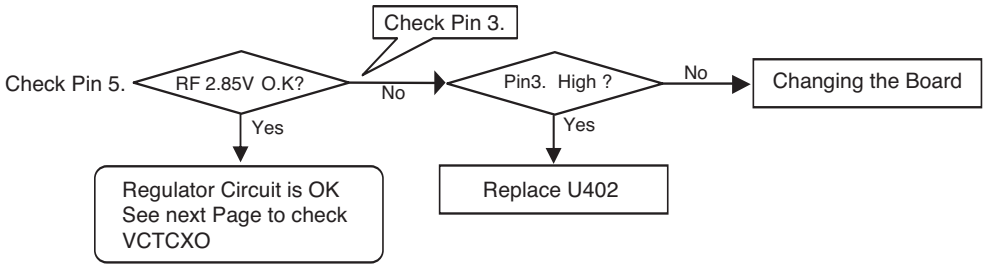
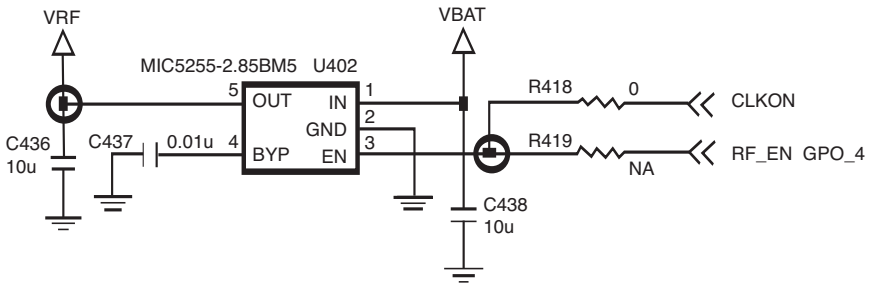
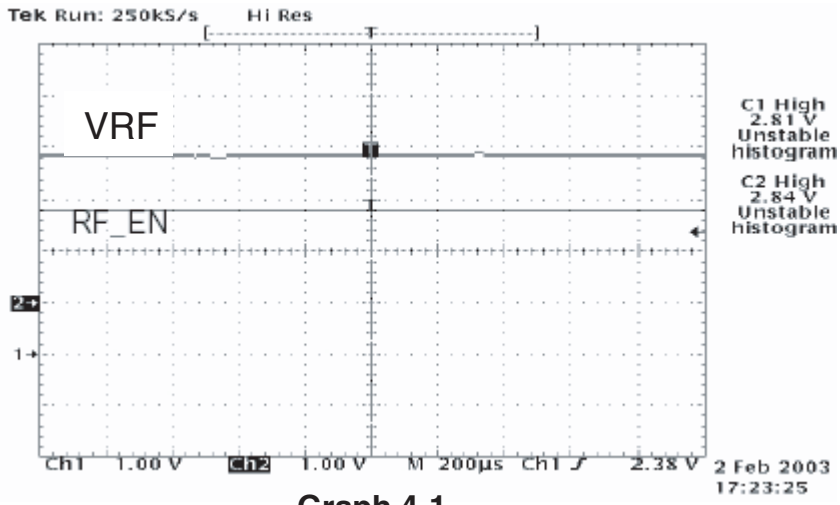


Figure 4-3







Graph 4-1

4.2.2 Checking VCTCXO Circuit

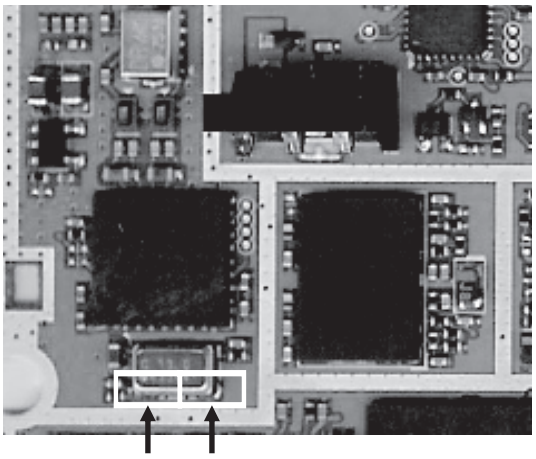
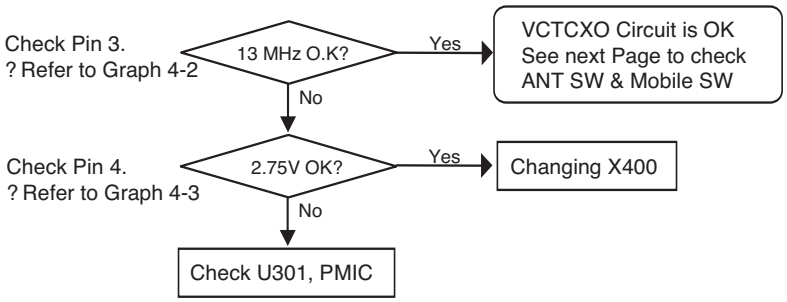
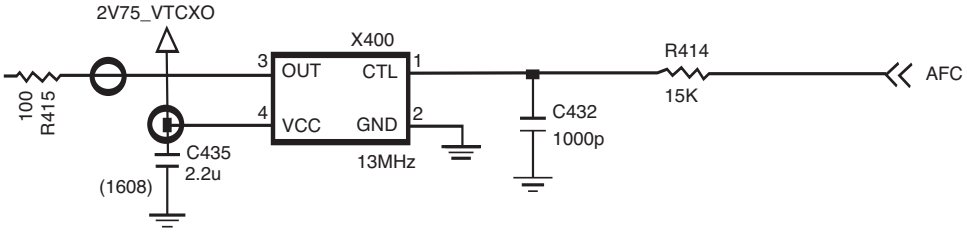
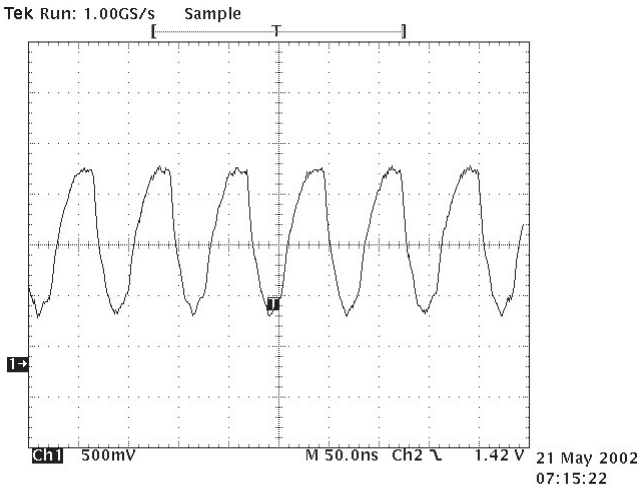


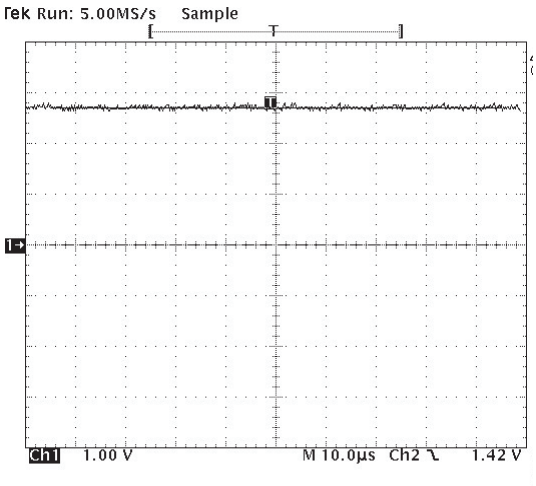
Figure 4-4







Graph 4-2



Graph 4-3

4.2.3 Checking PLL Control Signal

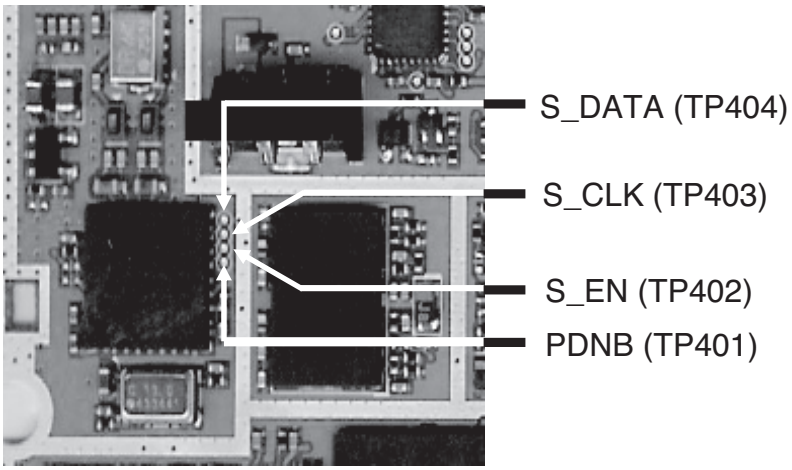
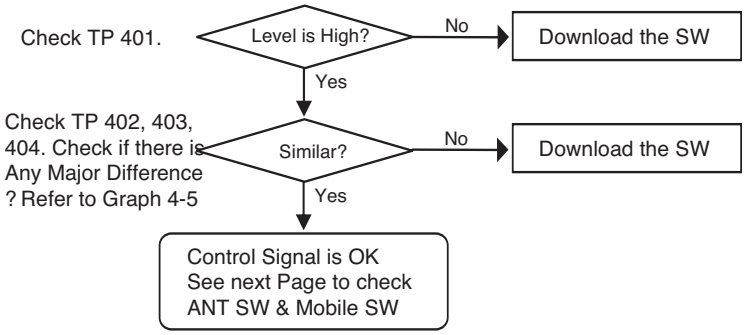
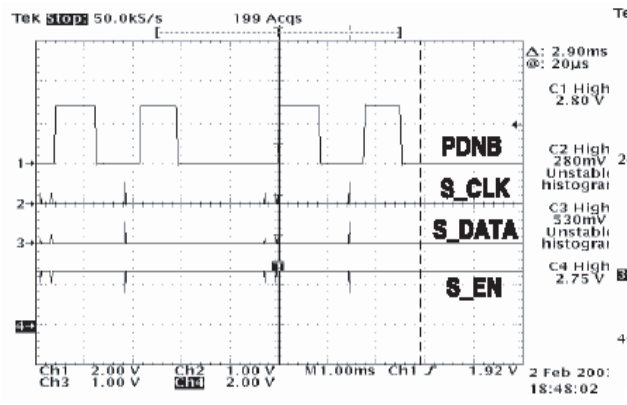
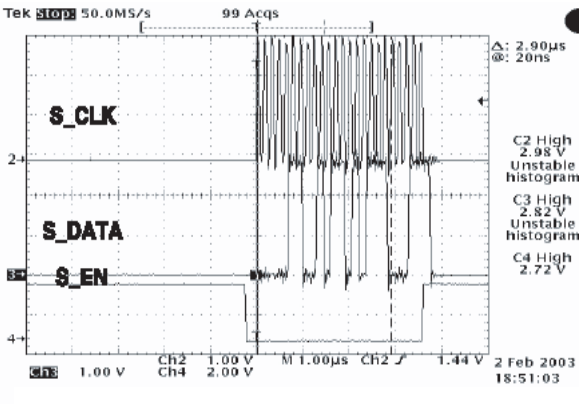


Figure 4-5





Graph 4-4



Graph 4-5

4.2.4 Checking Antenna Switch & Moblie Switch

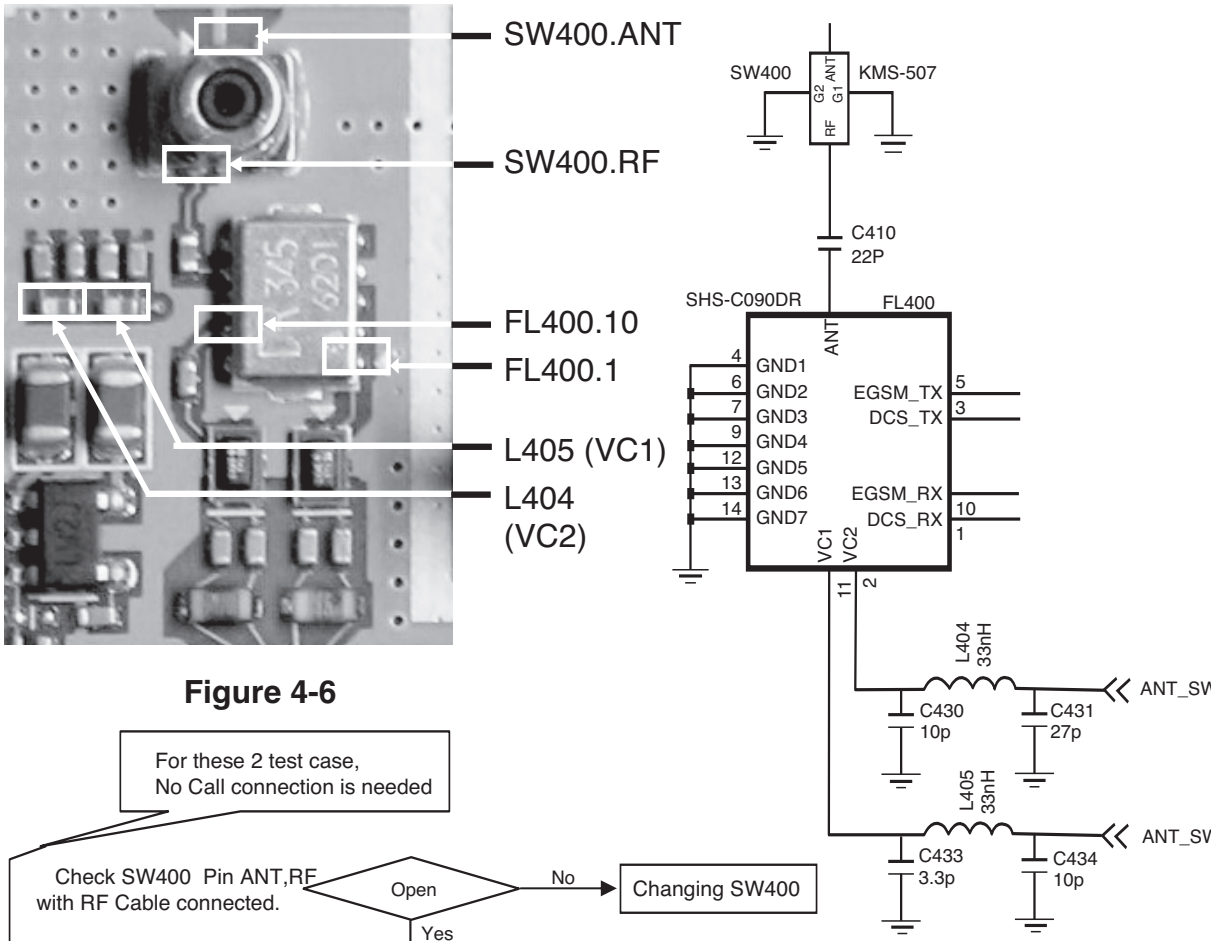


Figure 4-6

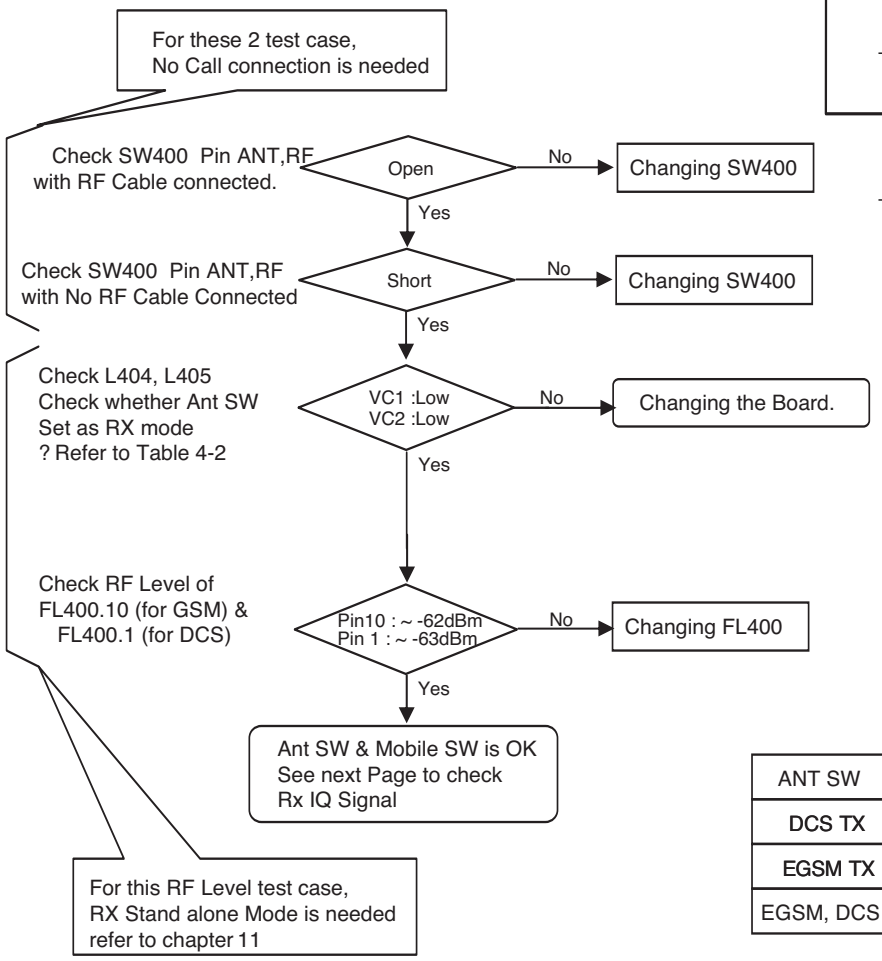
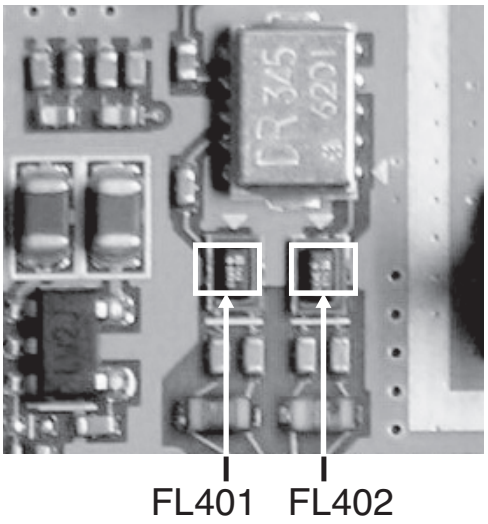


Table 4-2

ANT SW	VC1	VC2
DCS TX	0	1
EGSM TX	1	0
EGSM, DCS RX	0	0

4.2.5 Checking SAW Filter



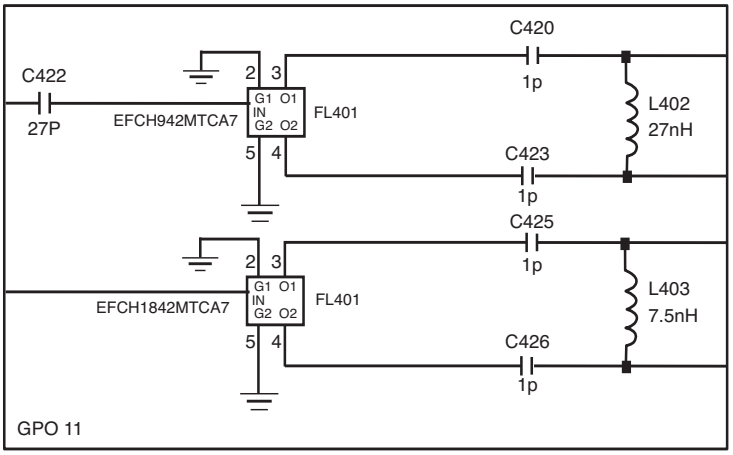
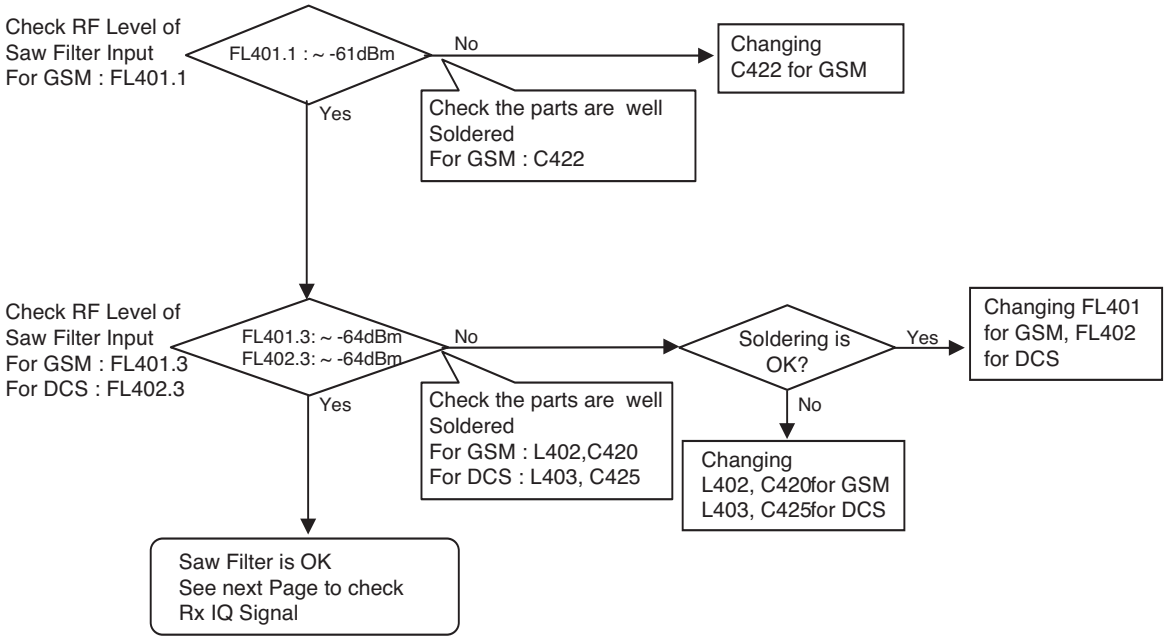


Figure 4-7



For the test,
RX Stand alone Mode is needed.
Refer to chapter 11

4.2.6 Checking RX IQ

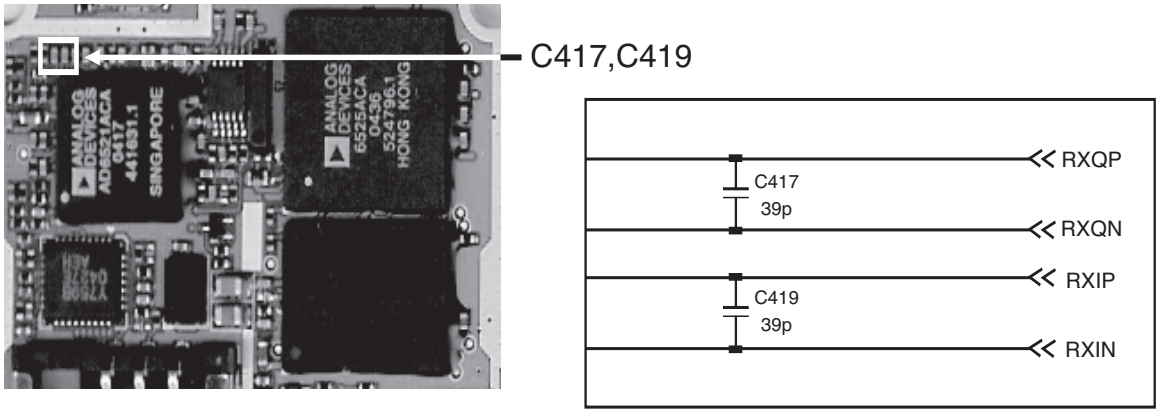
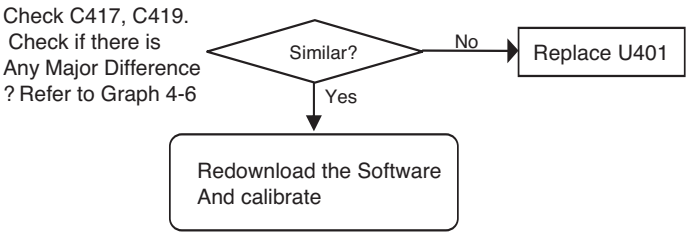
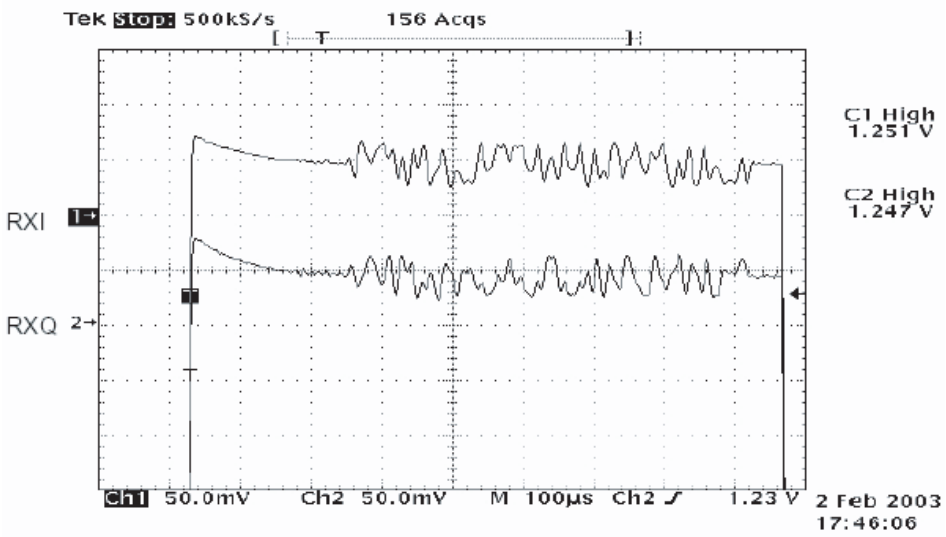


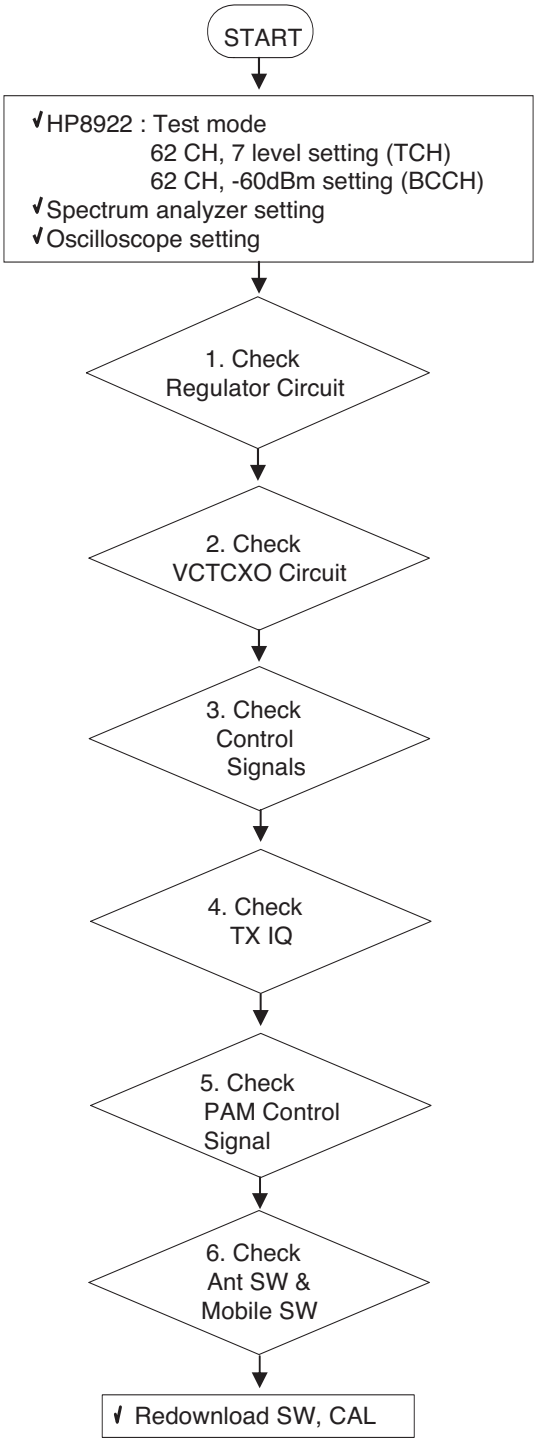
Figure 4-8





Graph 4-6

4.3 TX Trouble



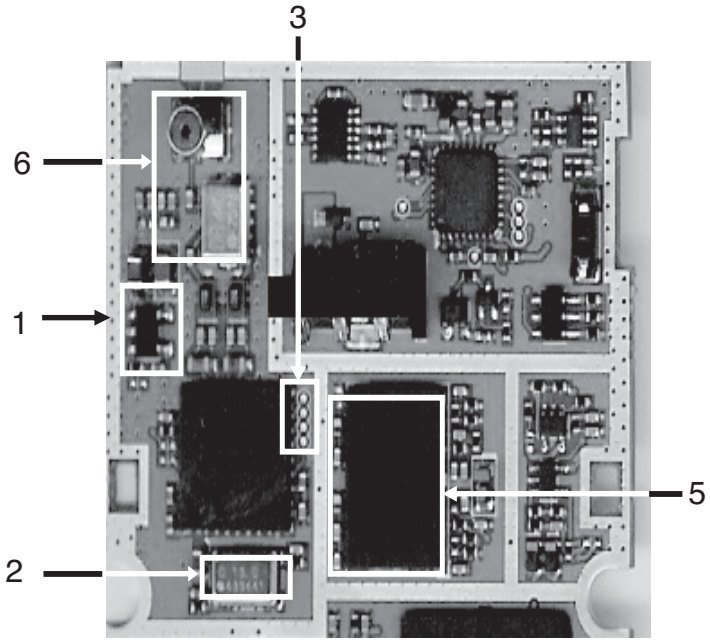


Figure 4-9

4.3.1 Checking Regulator Circuit

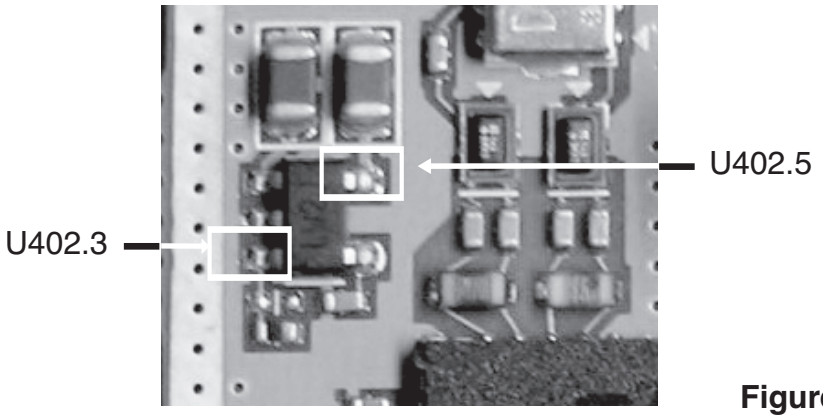
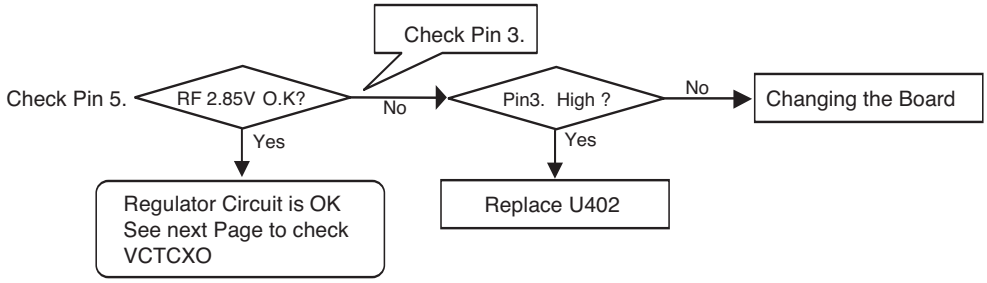
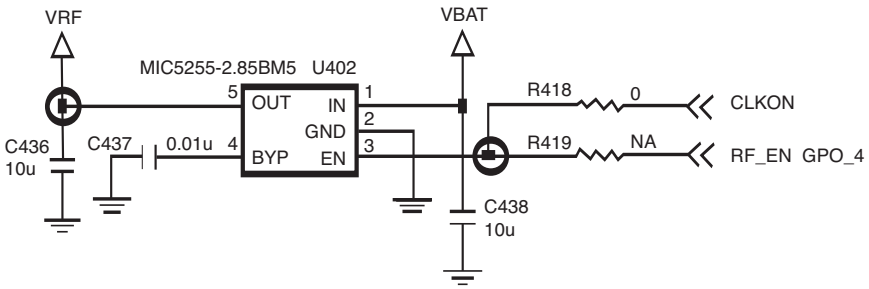
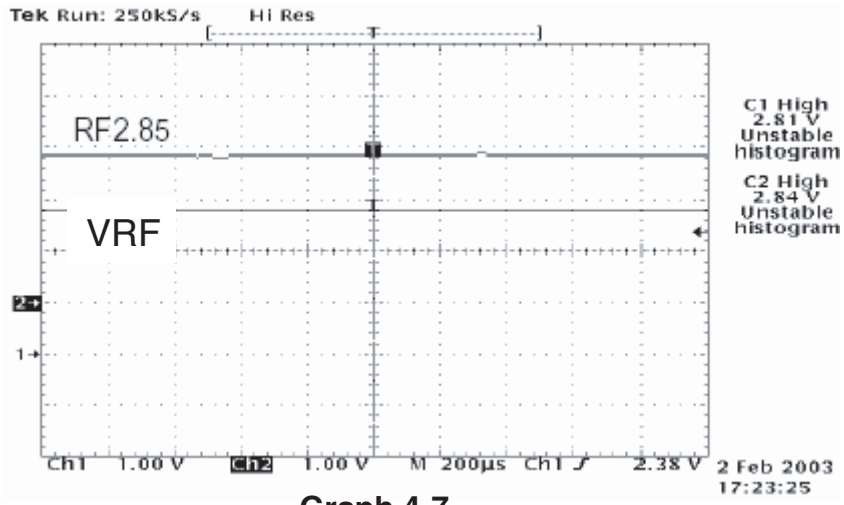


Figure 4-10







Graph 4-7

4.3.2 Checking VCTCXO Circuit

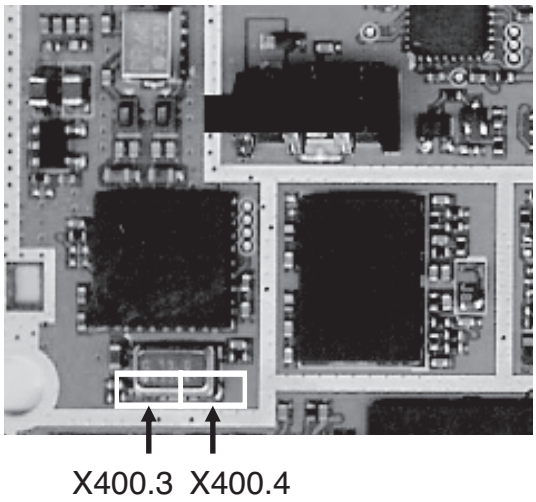
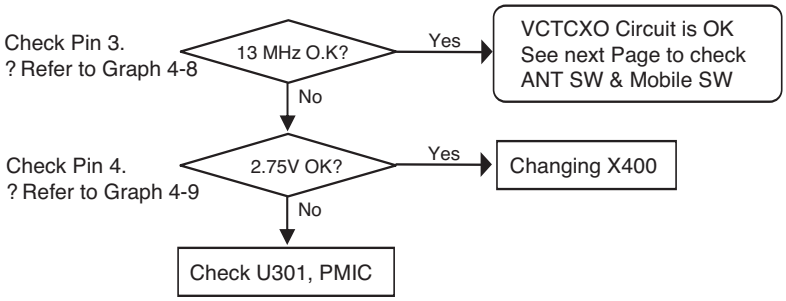
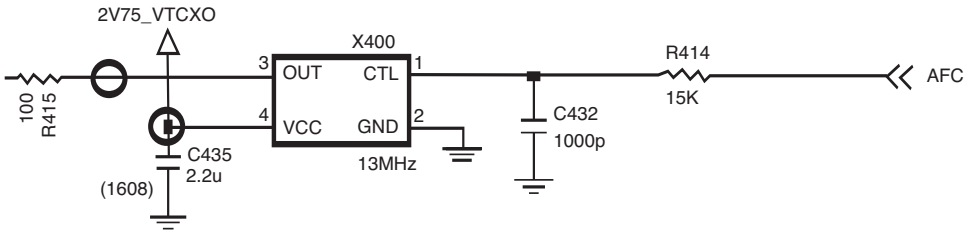
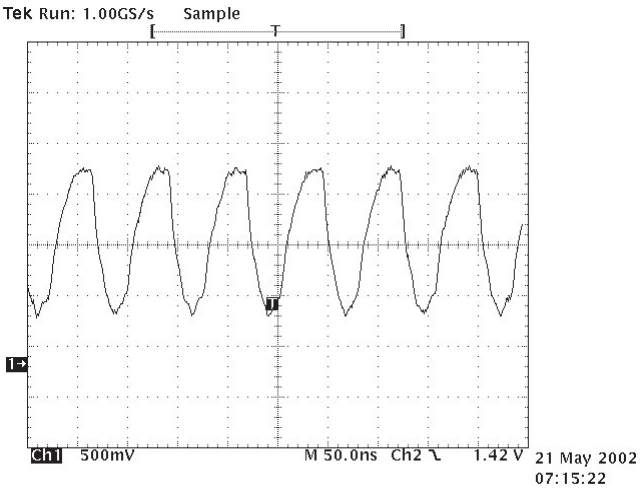


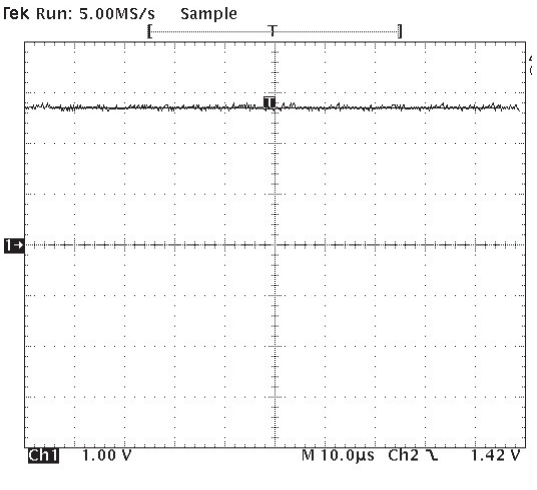
Figure 4-11







Graph 4-8



Graph 4-9

4.3.3 Checking PLL Control Signal

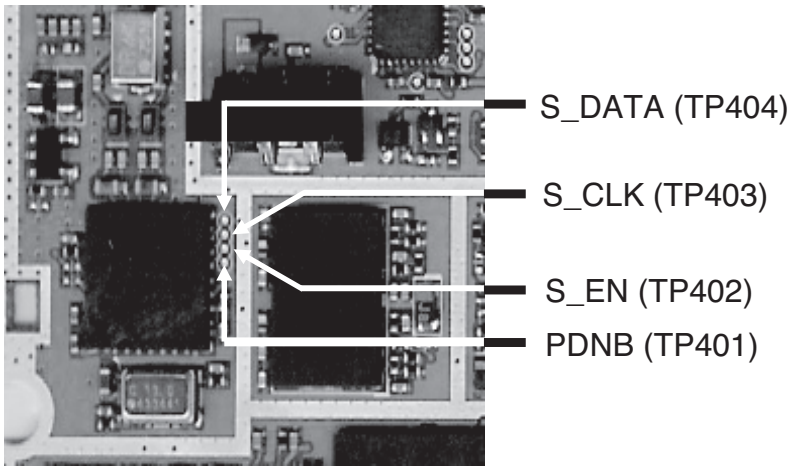
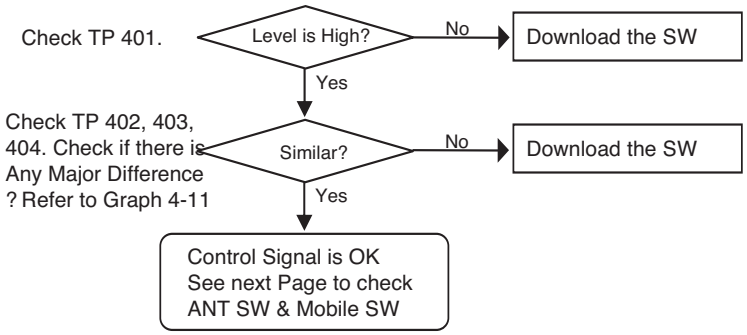
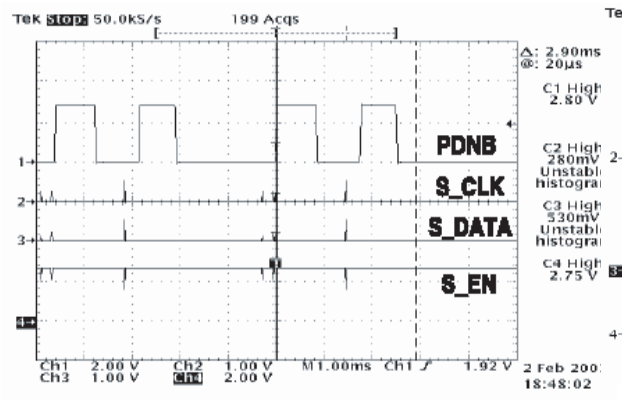
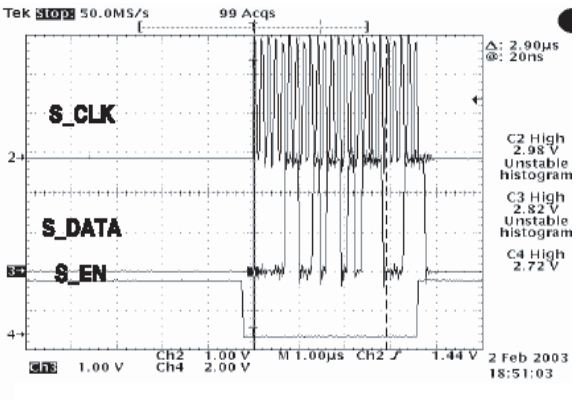


Figure 4-12





Graph 4-10



Graph 4-11

4.3.4 Checking TX IQ

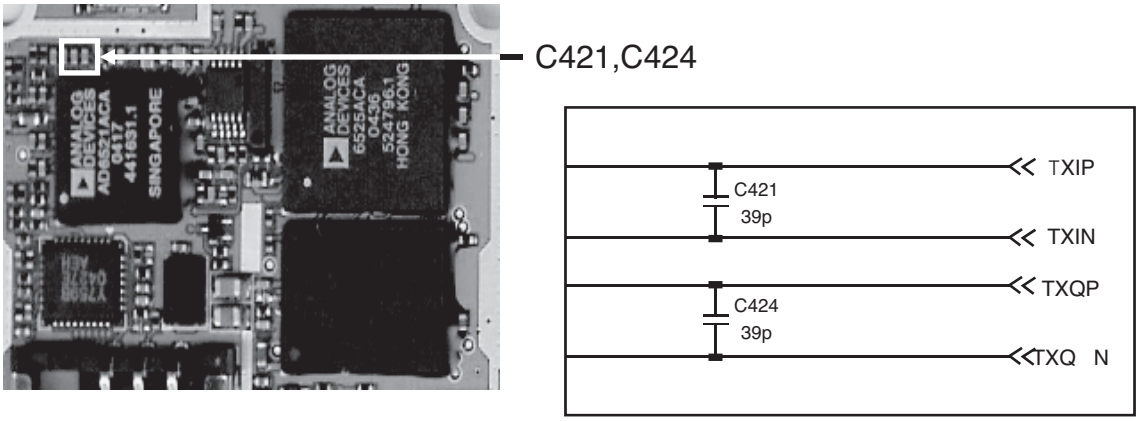
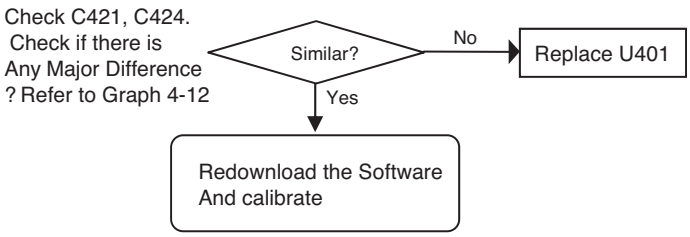
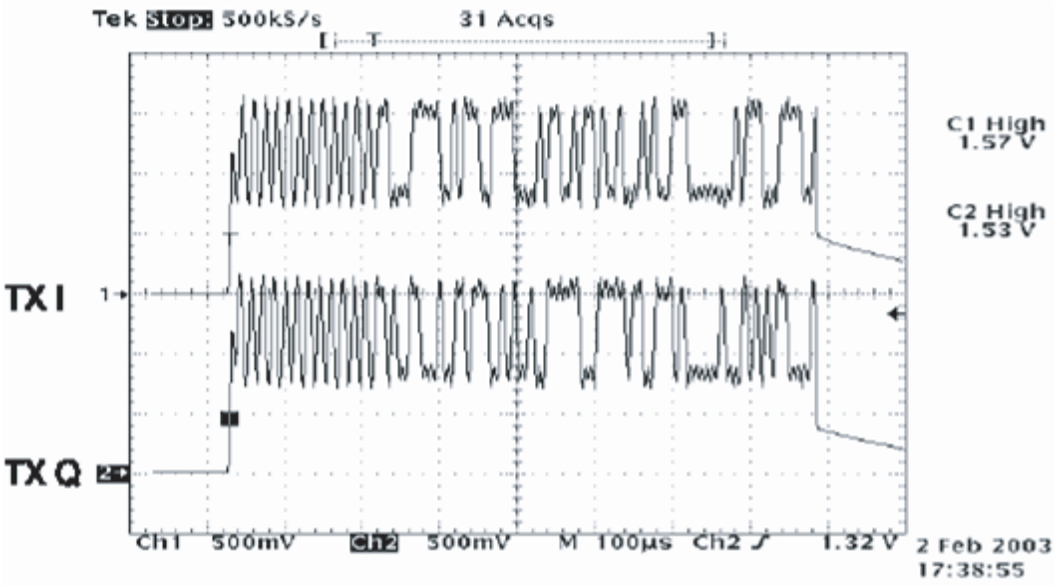


Figure 4-13





Graph 4-12

4.3.5 Checking PAM Control Signal

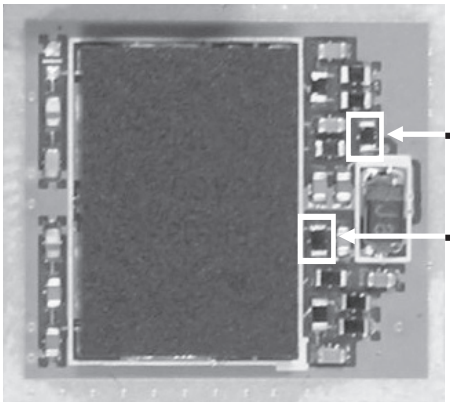
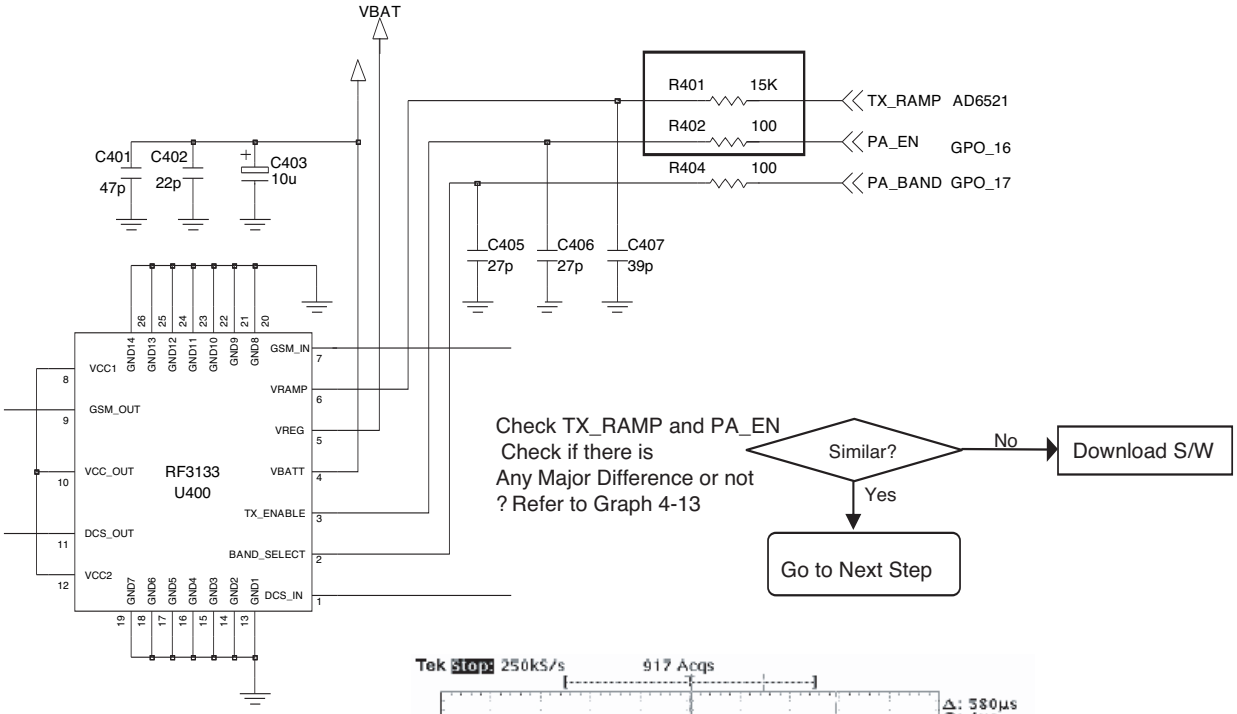
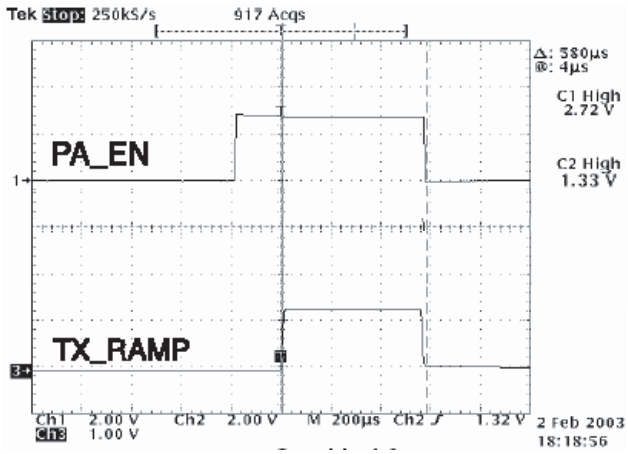


Figure 4-14





Graph 4-13

4.3.6 Checking Antenna Switch & Mobile Switch

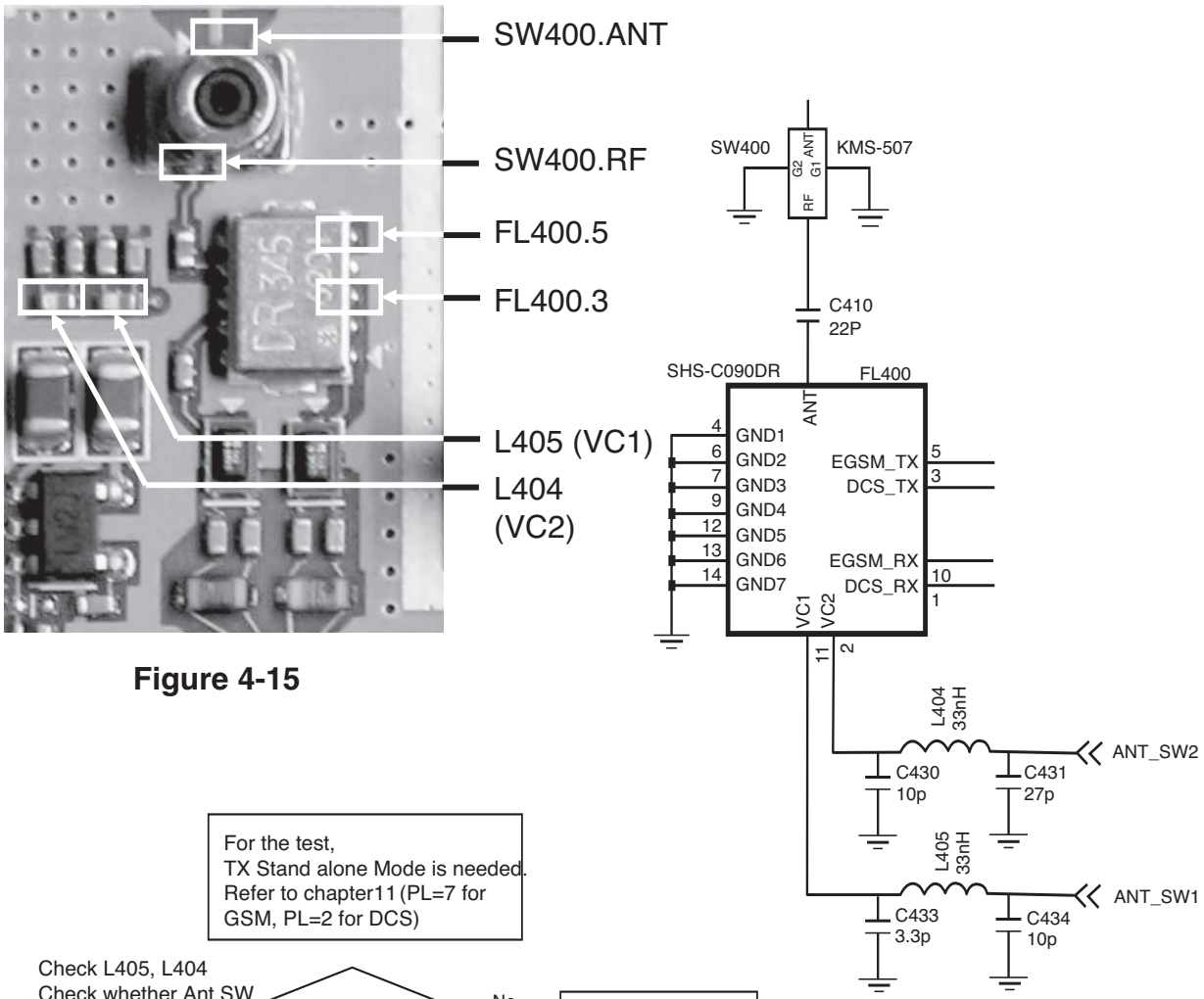


Figure 4-15

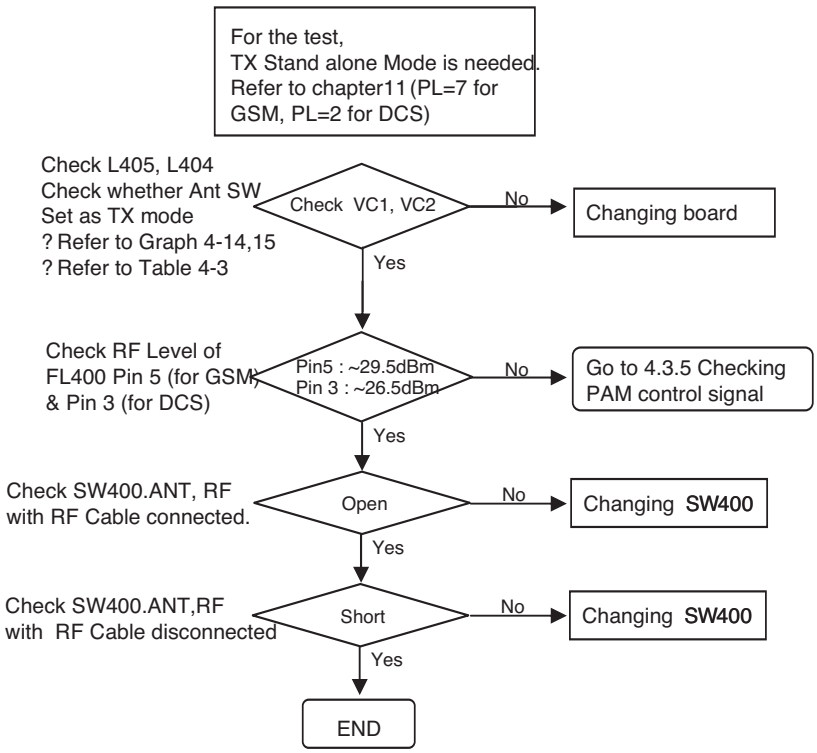
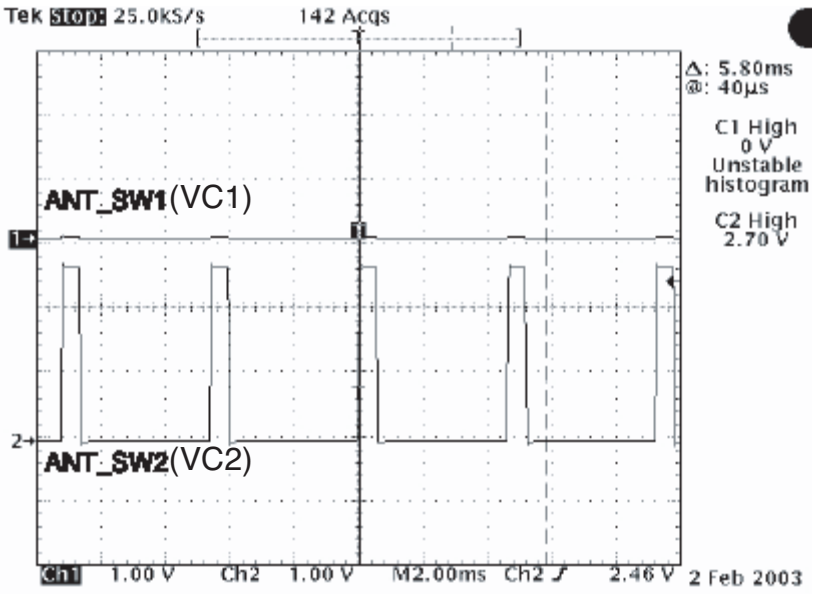
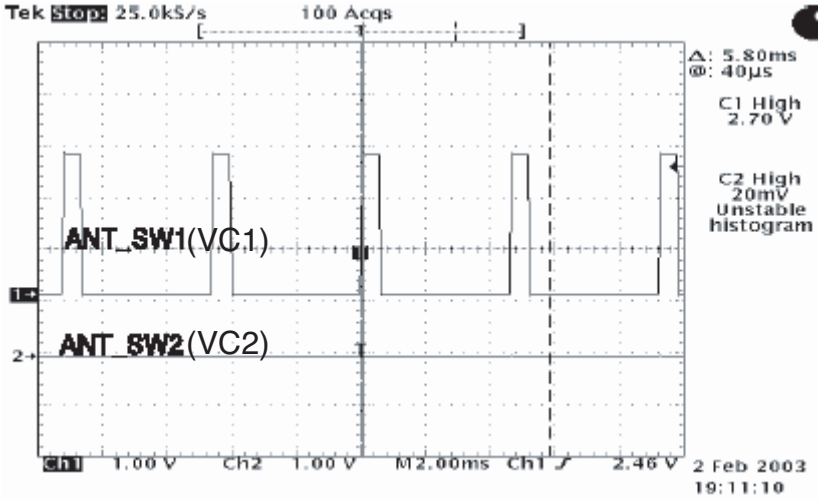


Table 4-3

ANT SW	VC1	VC2
DCS TX	0	1
EGSM TX	1	0
EGSM, DCS RX	0	0



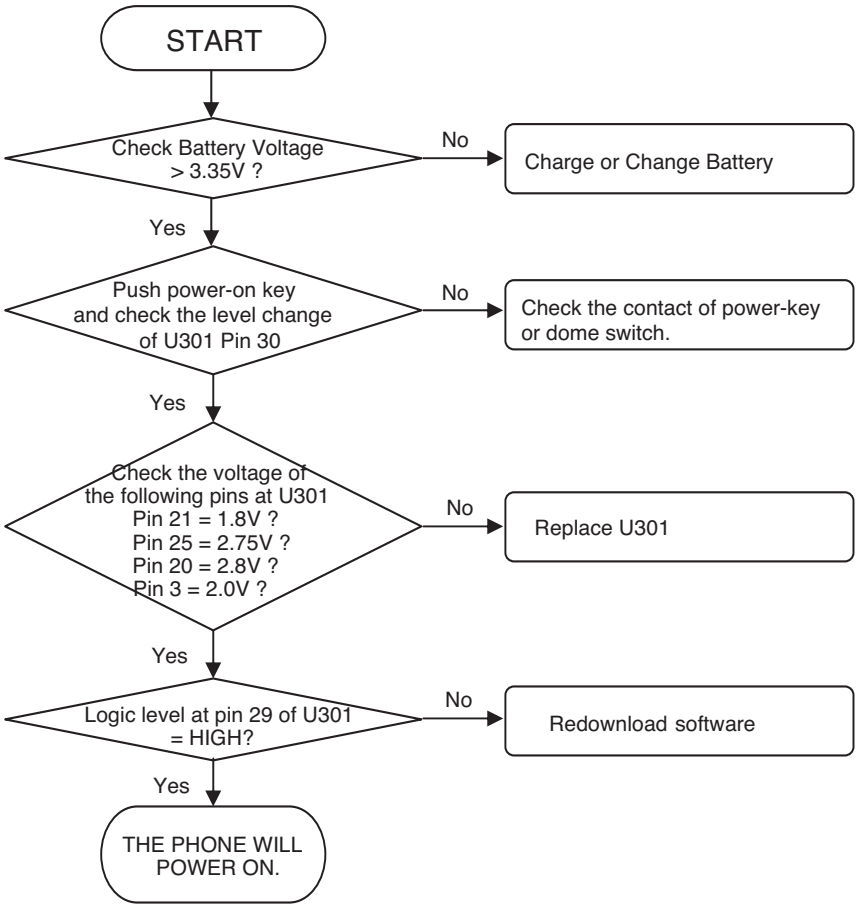
Graph 4-14 DCS TX



Graph 4-15 EGSM TX

4.4 Power On Trouble

SETTING : Connect PIF, and se t remote switch off at PIF
* Refer to Figure 16



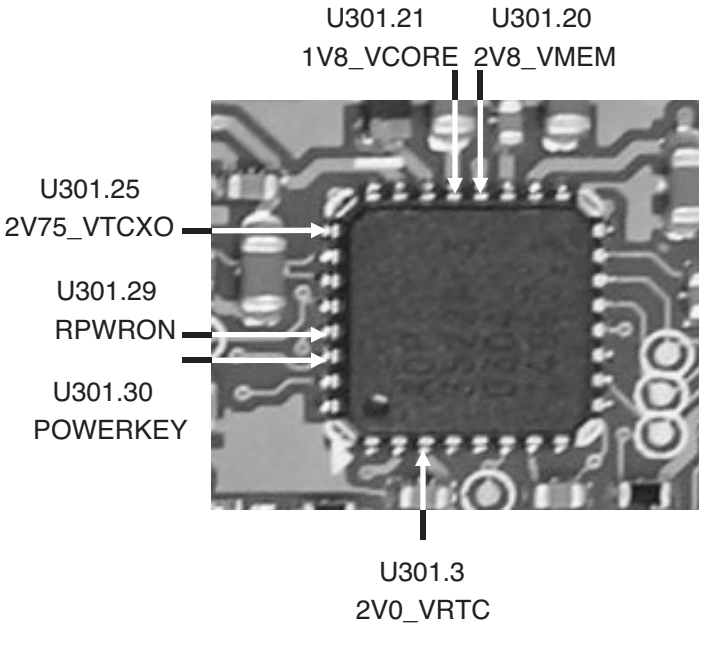
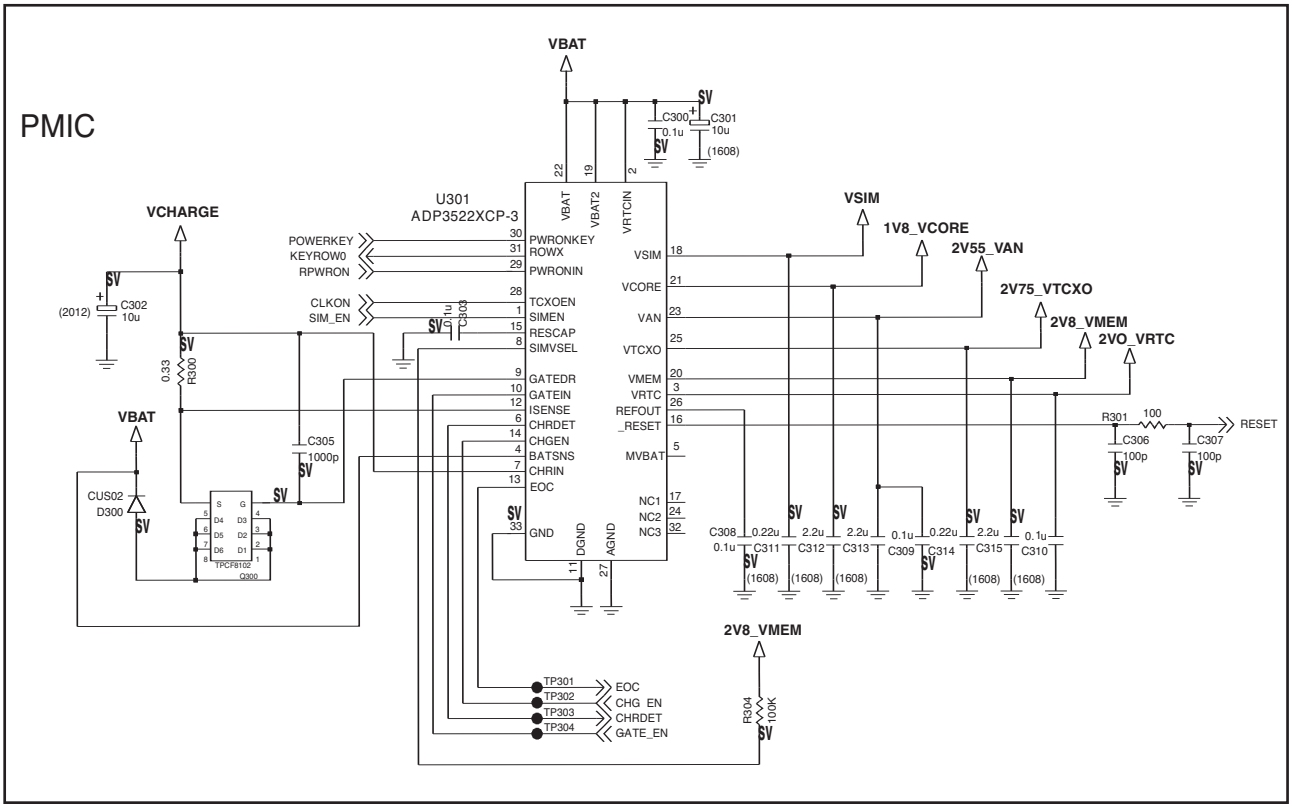
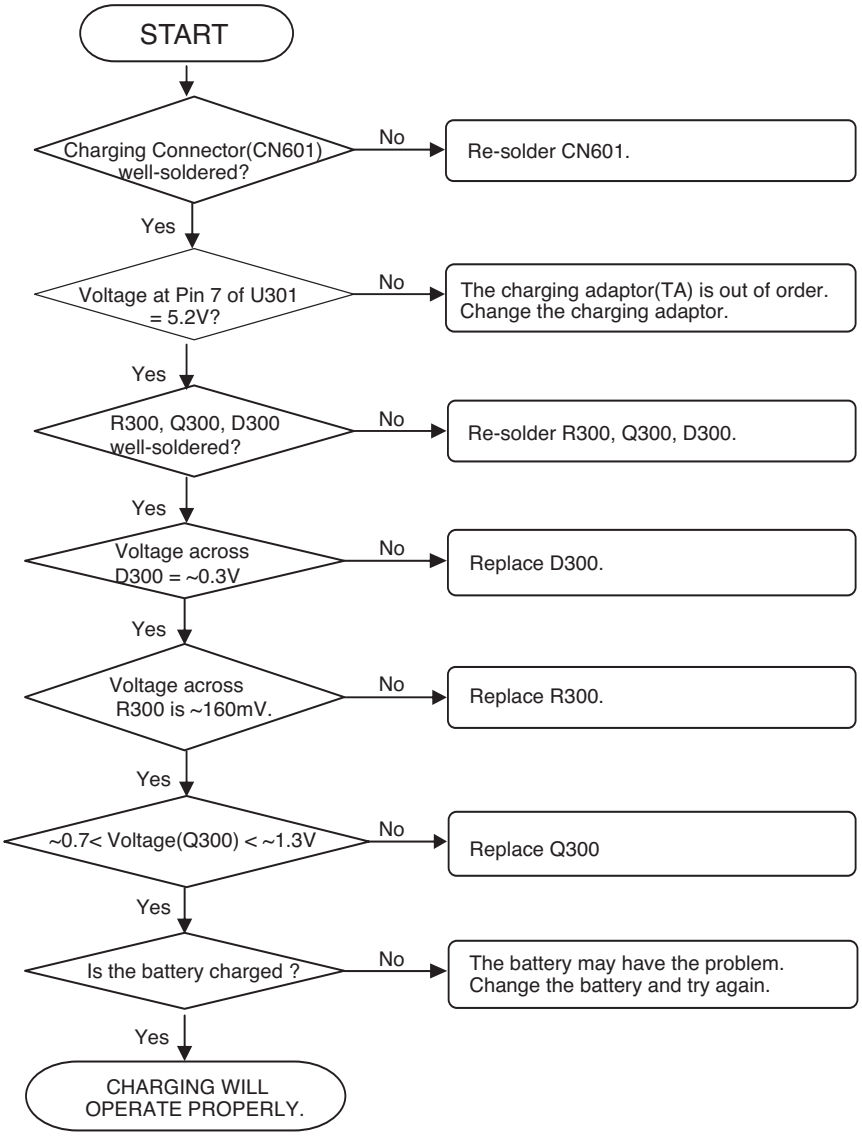

U301.21
1V8_VCORE
U301.20
2V8_VMEM
U301.25
2V75_VTCXO
U301.29
RPWRON
U301.30
POWERKEY
U301.3
2V0_VRTC

Figure 4-16


PMIC
VBAT
U301
ADP3522XCP-3
VCHARGE
POWERKEY
KEYROW0
RPWRON
CLKON
SIM_EN
PWRONKEY
ROWX
PWRONIN
TCXOEN
SIMEN
RESCAP
SIMVSEL
GATEDR
GATEIN
ISENSE
CHRDET
CHGEN
BATSNS
CHRIN
EOC
GND
VBAT
VBAT2
VRTCIN
VSIM
VCORE
VAN
VTCXO
VMEM
VRTC
REFOUT
_RESET
MVBAT
NC1
NC2
NC3
DGND
AGND
1V8_VCORE
2V55_VAN
2V75_VTCXO
2V8_VMEM
2VO_VRTC
RESET
TP301
TP302
TP303
TP304
EOC
CHG_EN
CHRDET
GATE_EN

4.5 Charging Trouble

SETTING : Connect the battery (3.4 ~ 4V) and the charging adaptor(TA) to the phone



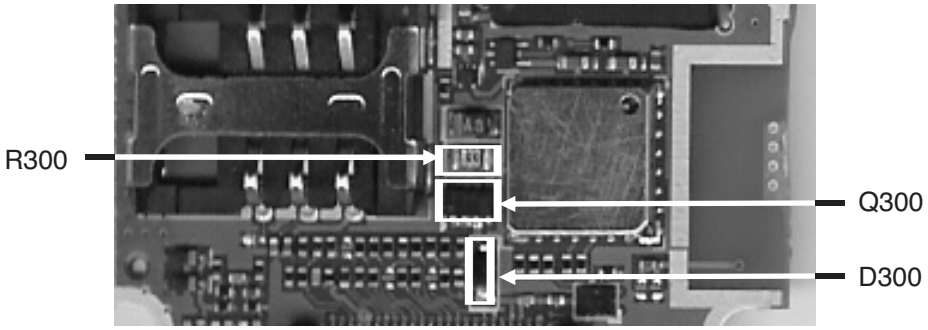
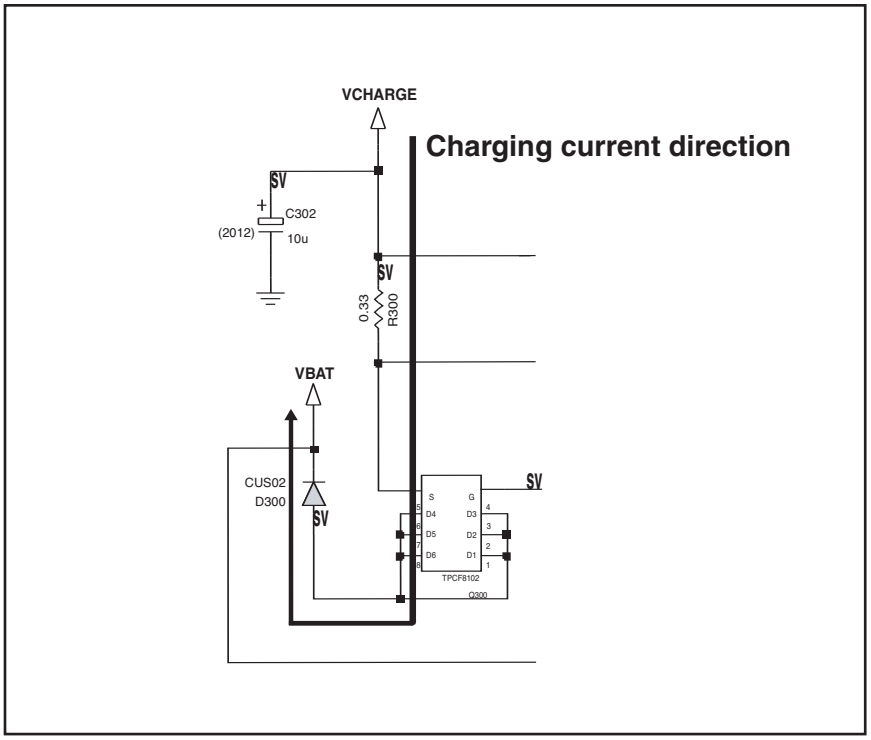

R300
Q300
D300

Figure 4-17


VCHARGE
Charging current direction
5V
C302
(2012)
10u
5V
0.33
R300
VBAT
CUS02
D300
5V
5V
S
G
D4
D3
D5
D2
D6
D1
TPCF8102
Q300

4.6 LCD Trouble.

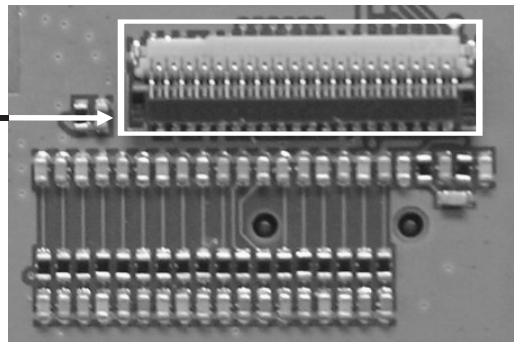


Figure 4-18

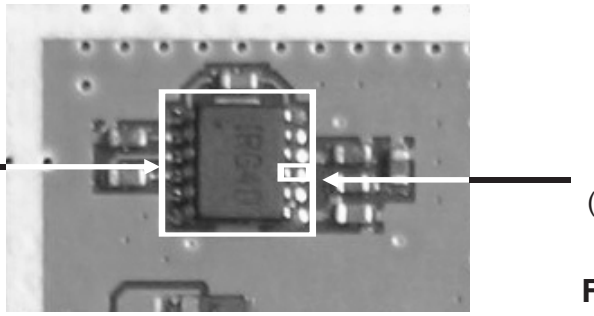
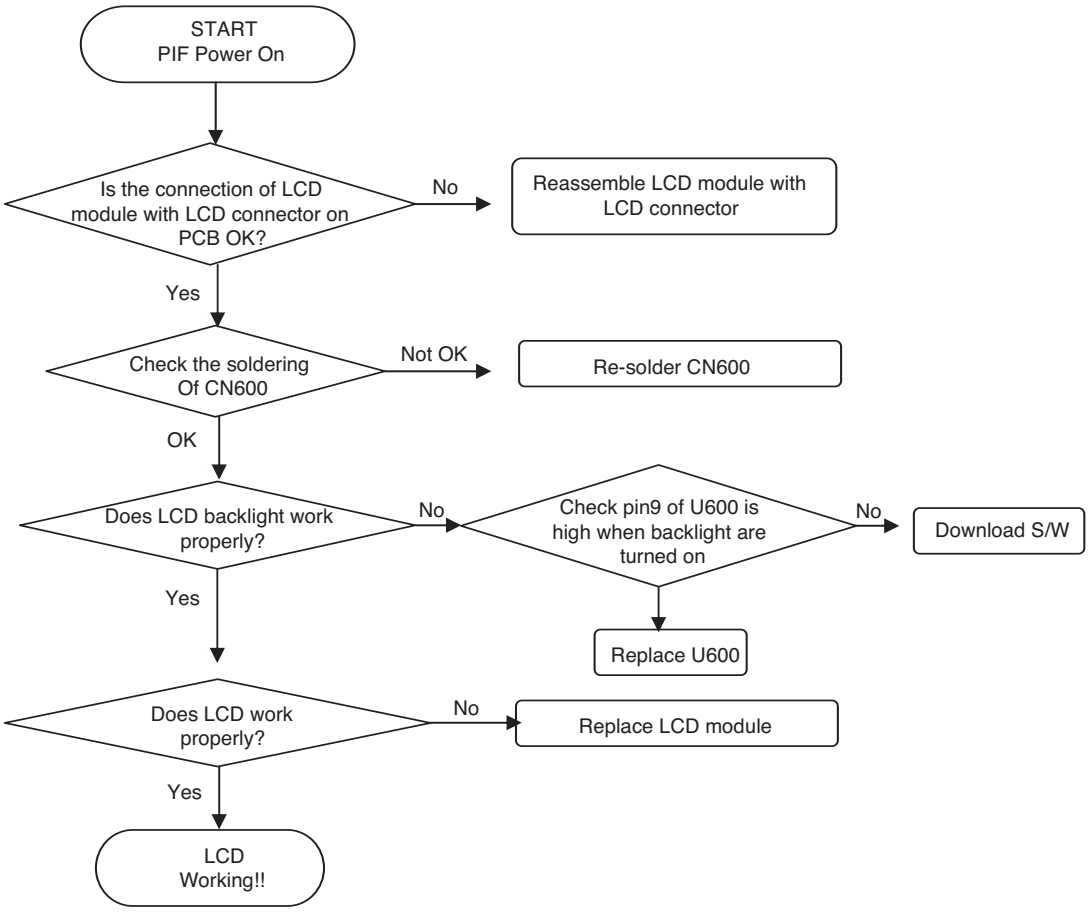


Figure 4-19



4.7 Receiver Trouble

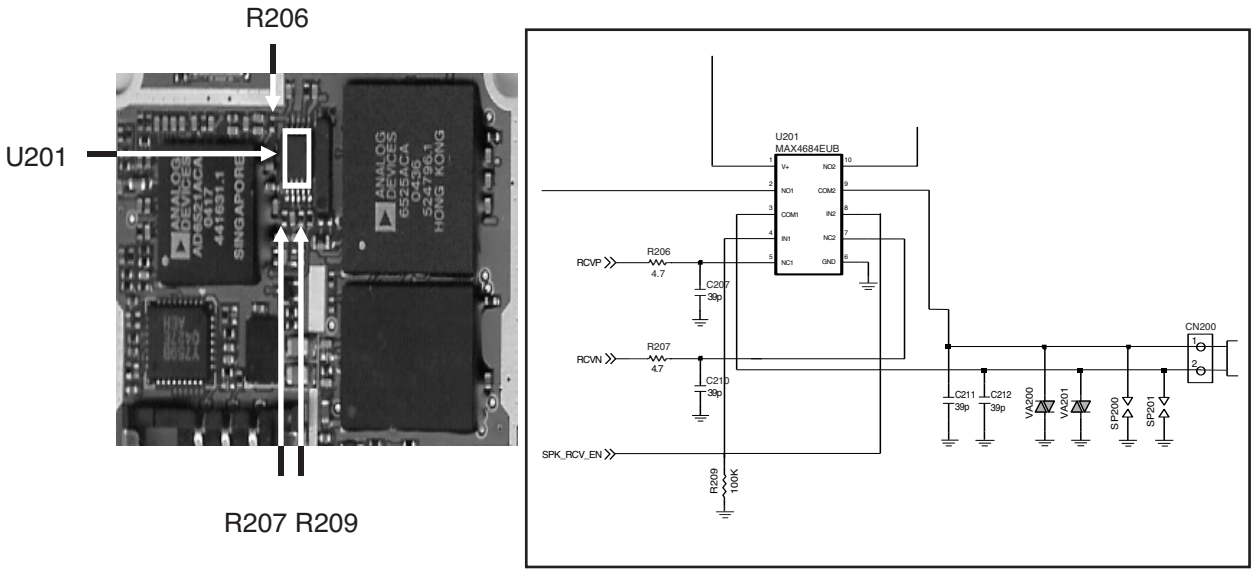
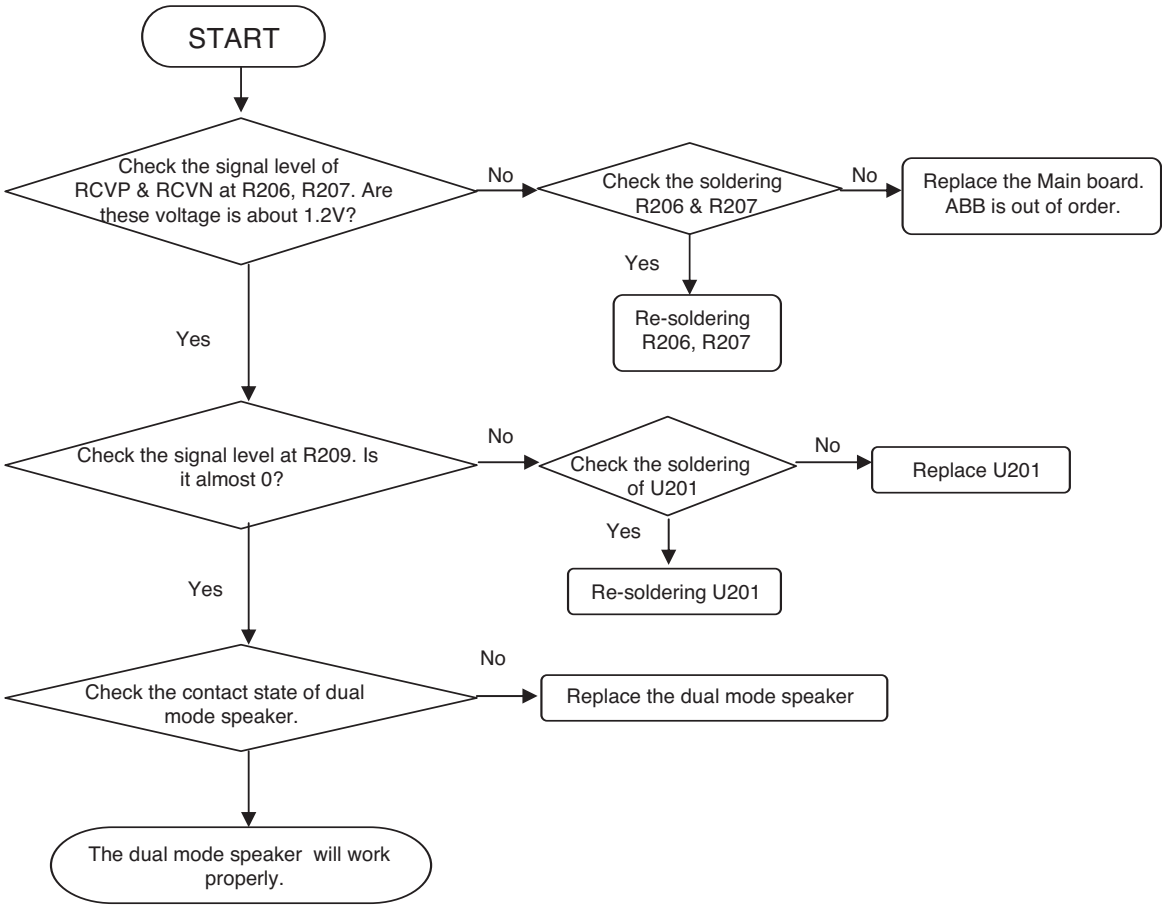
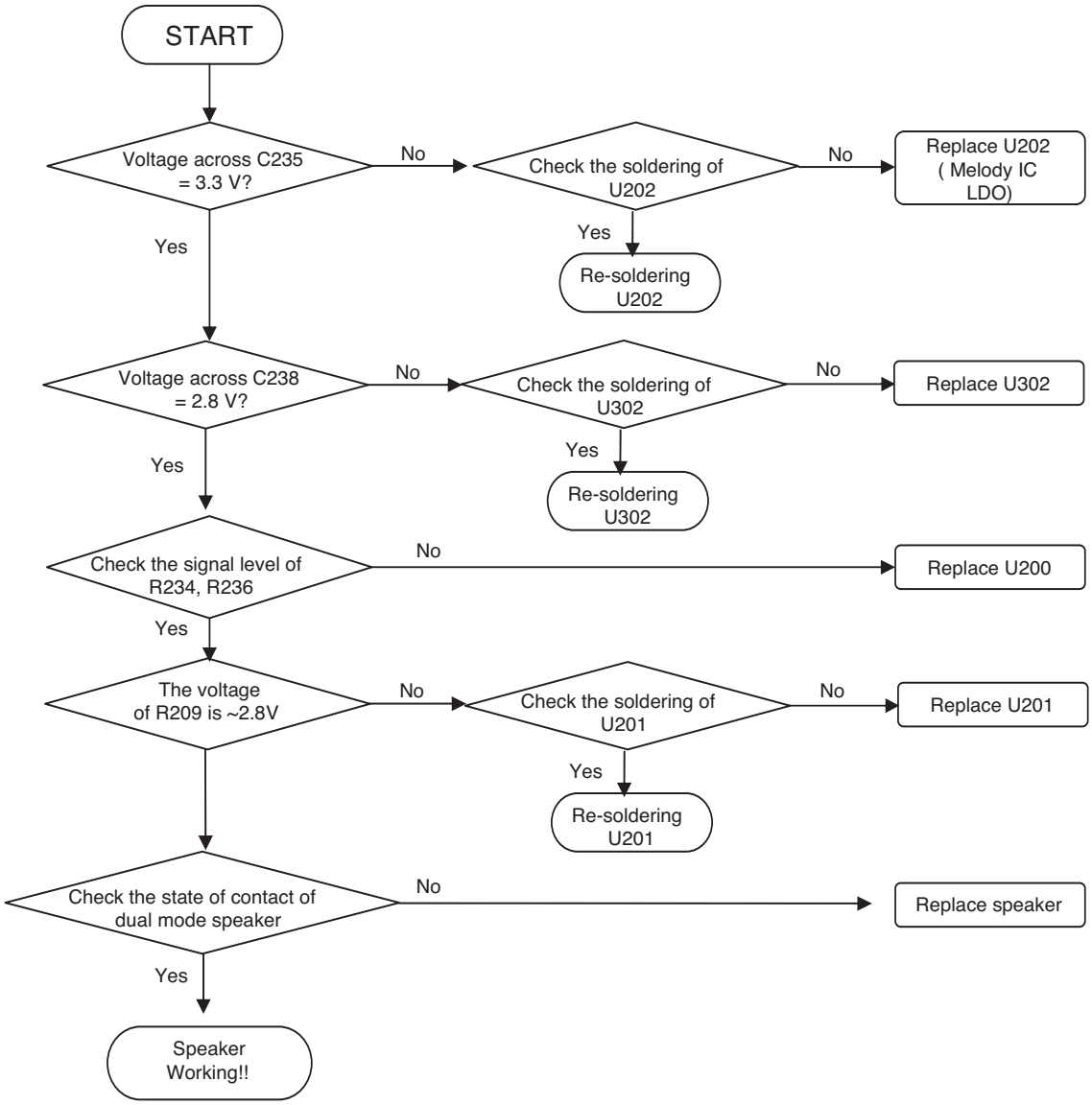


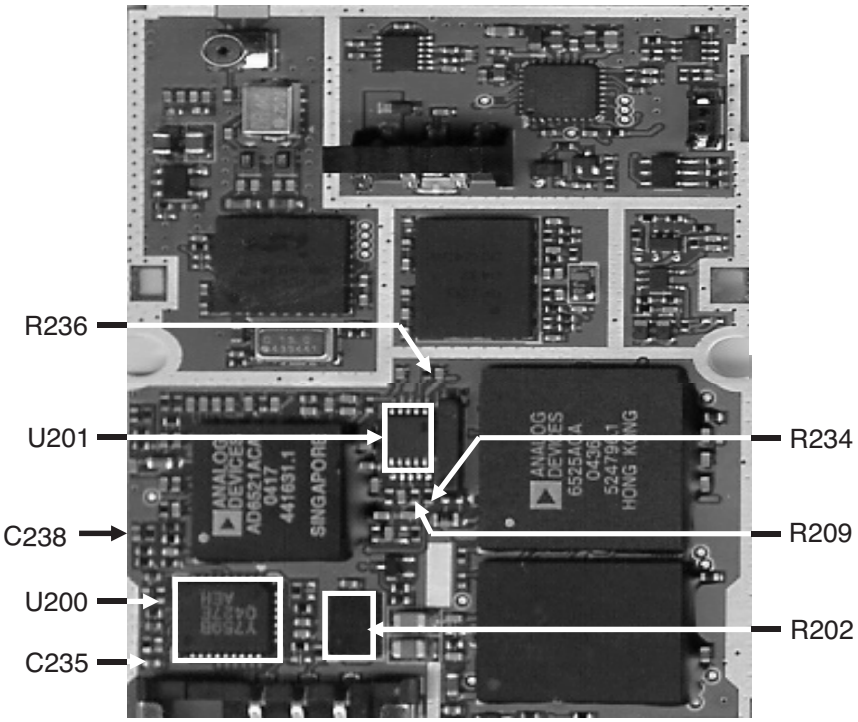
Figure 4-20



4.8 Speaker Trouble

SETTING: Connect PIF to the phone, and Power on. Enter The engineering mode, and set “Melody on” at Buzzer of BB test Menu




R236
U201
C238
U200
C235
R234
R209
R202

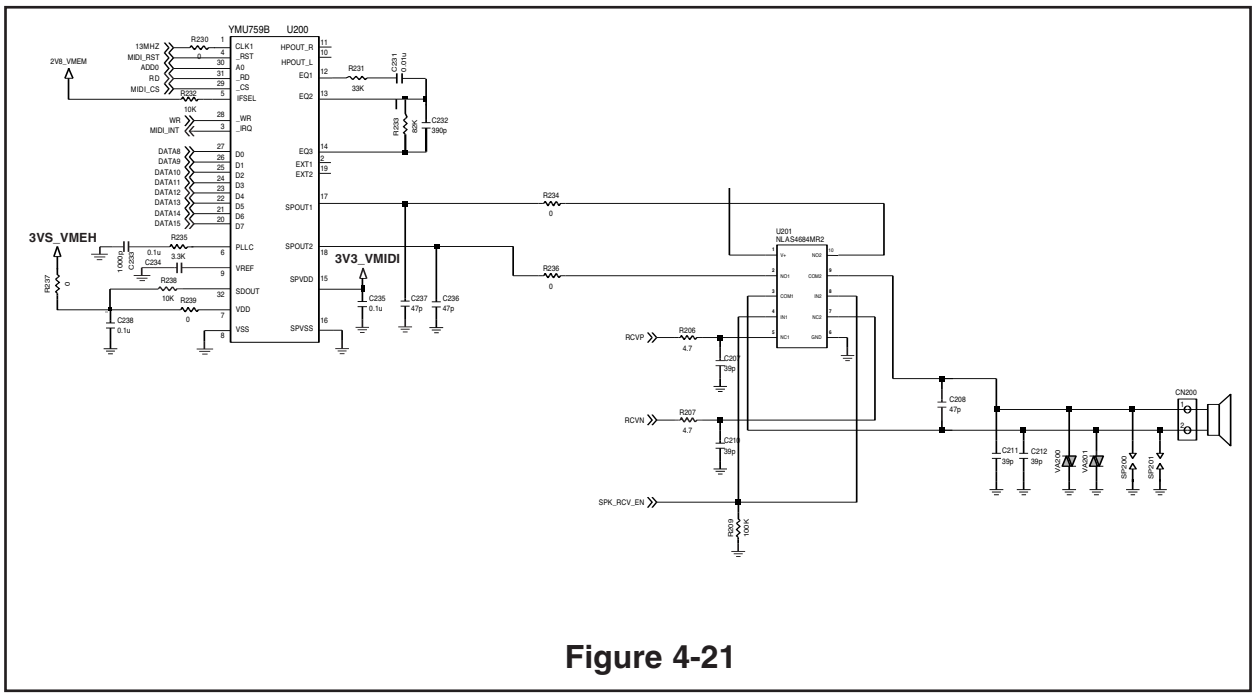

YMU759B
U200
3VS_VMEH
3V3_VMIDI
U201
NLAS4684MR2
CN200

Figure 4-21

4.9 MIC Trouble

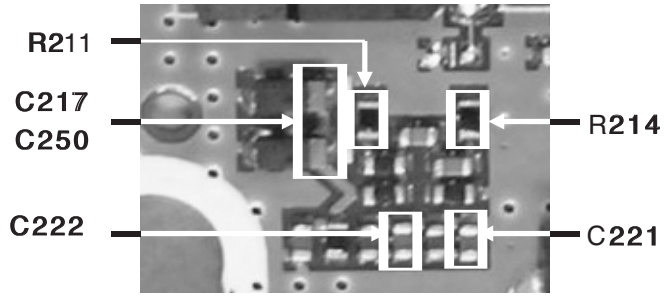


Figure 4-22

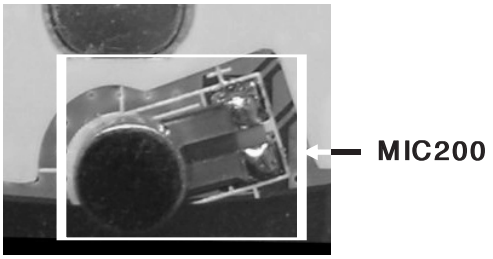
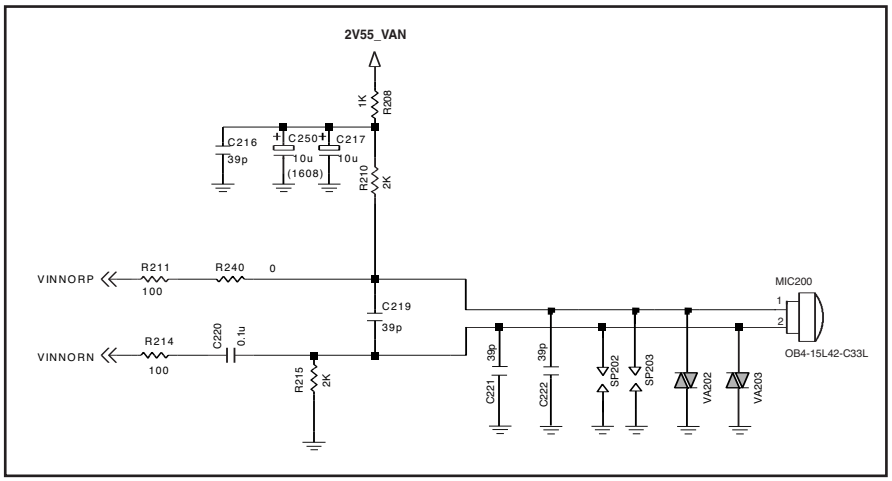
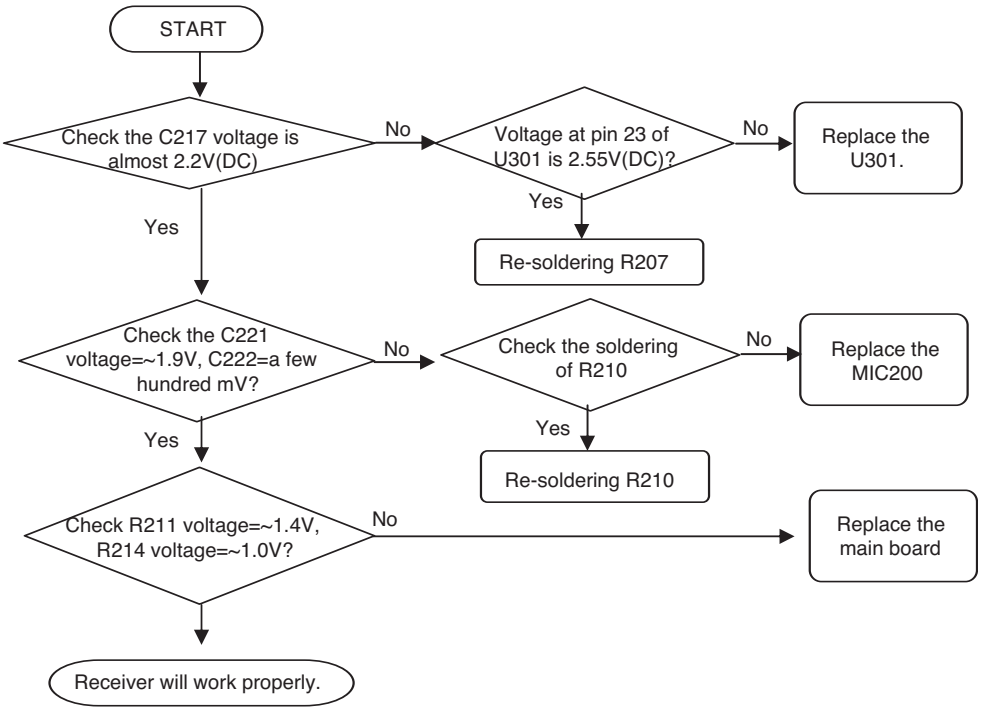


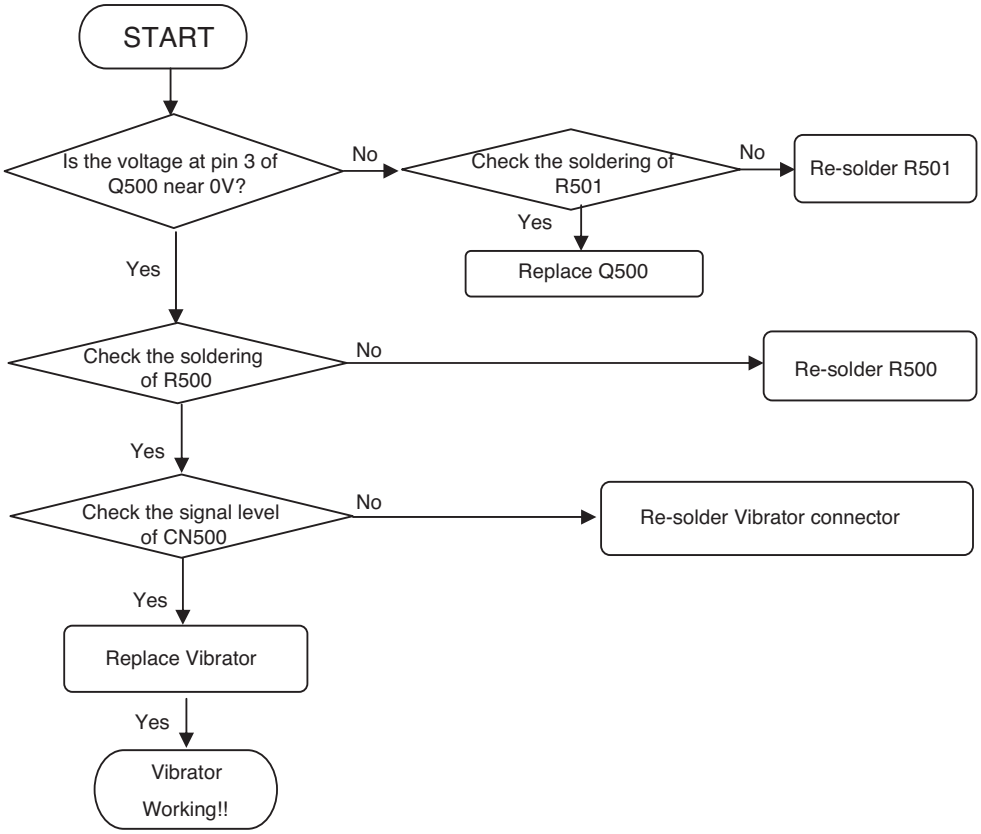
Figure 4-23





4.10 Vibrator Trouble

SETTING: After initialize Agilent 8960, Test in EGSM, connect PIF to the phone, and Power on. Enter The engineering mode, and set “Vibrator on”at Vibration of BB test menu



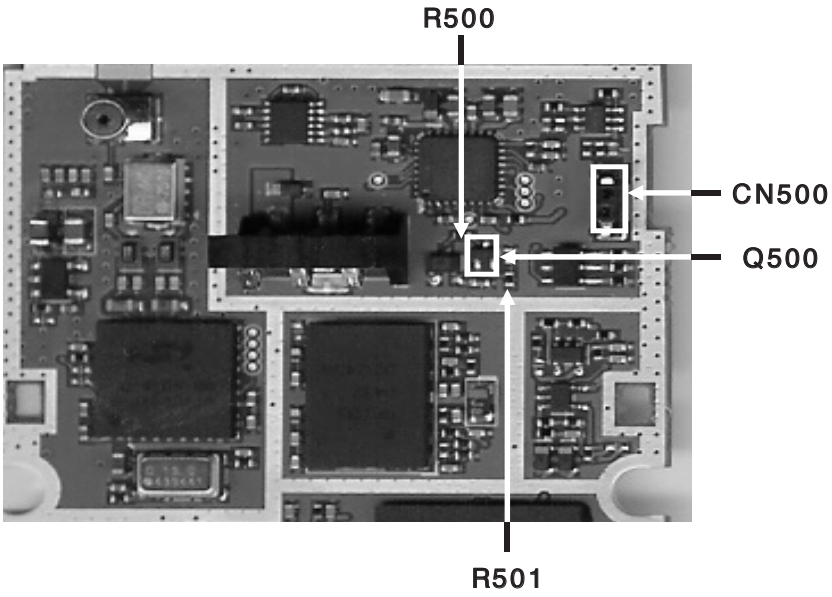
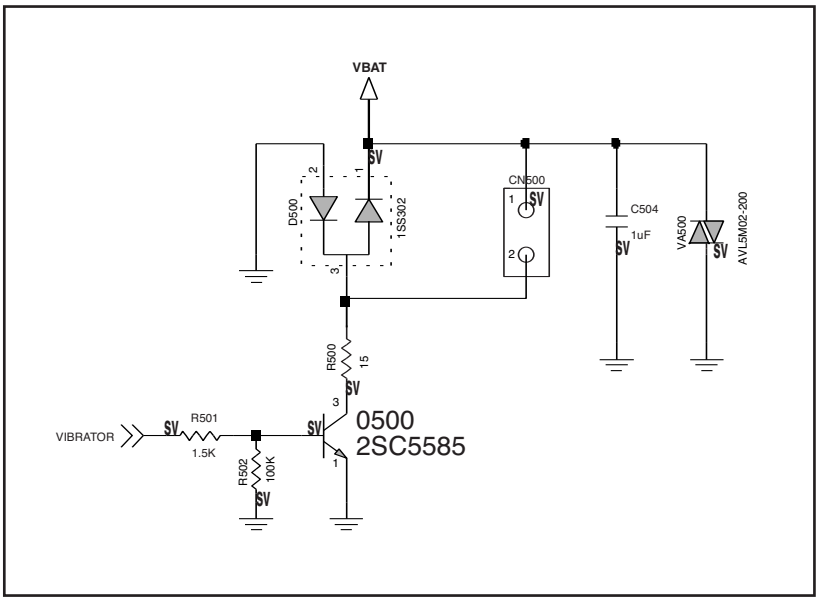
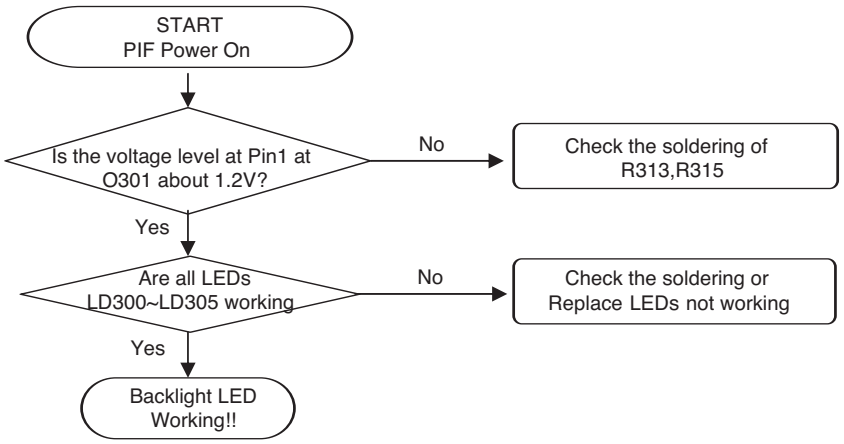

R500
CN500
Q500
R501

Figure 4-24


VBAT
5V
D500
1SS302
CN500
C504
1uF
VA500
AVL5M02-200
R500
15
VIBRATOR
R501
1.5K
R502
100K
0500
2SC5585

4.11 Key Backlight LED Trouble

SETTING: Connect PIF to the phone, and power on. Enter engineering mode, and set “Backlight on” at “BB test-Backlight” menu



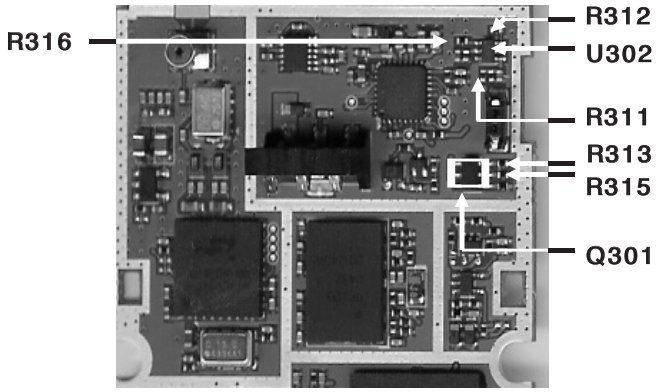


Figure 4-25

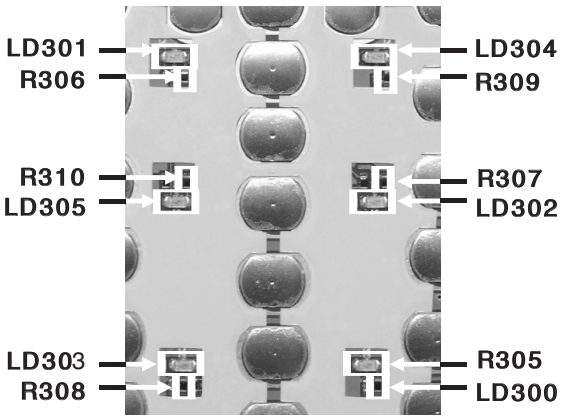
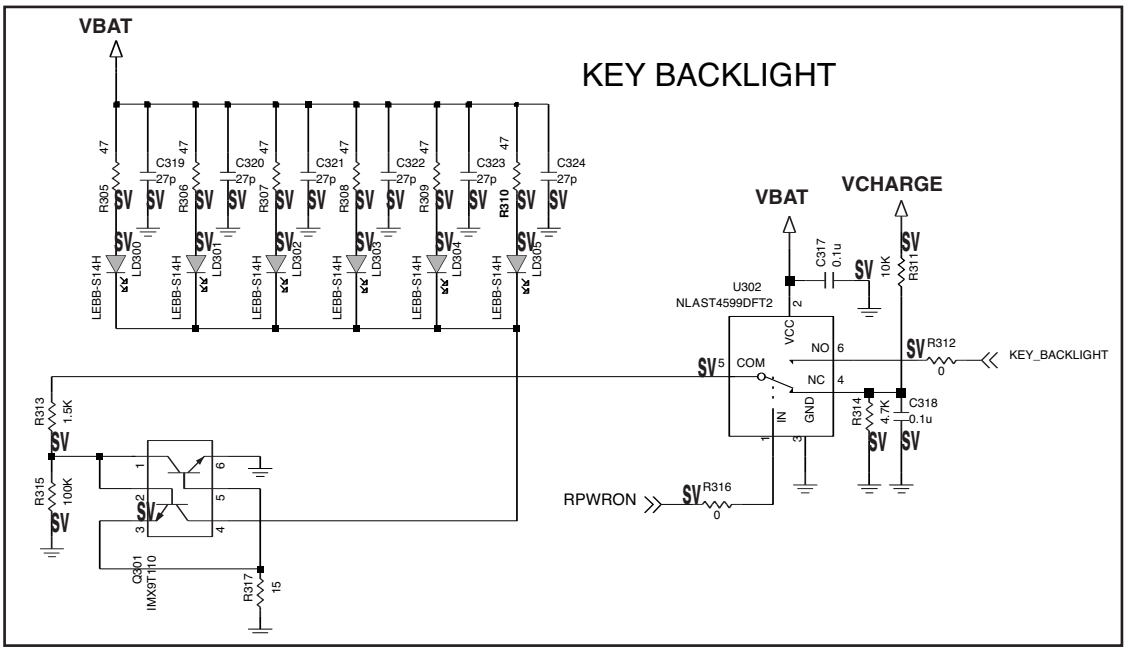
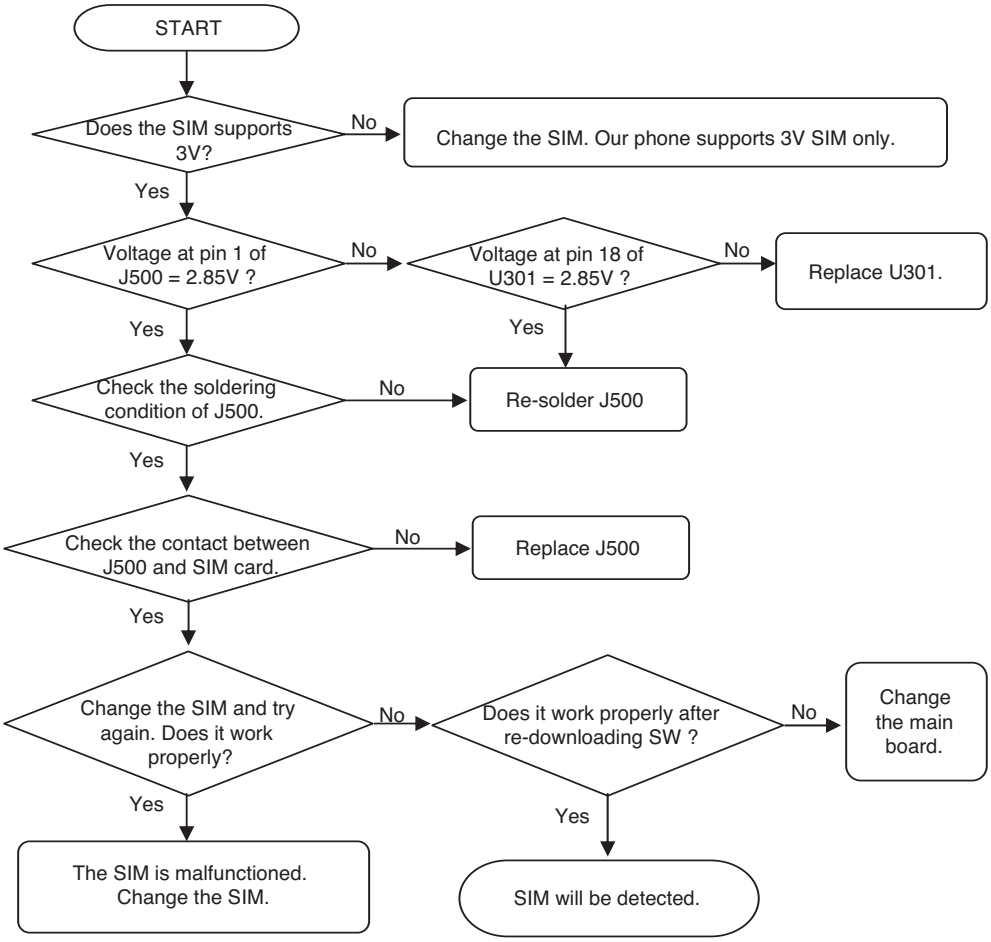


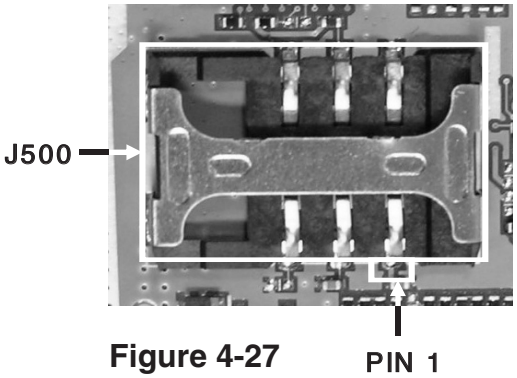
Figure 4-26



4.12 SIM Detect Trouble

Setting : Insert the SIM into J301. Connect PIF to the phone, and power ON





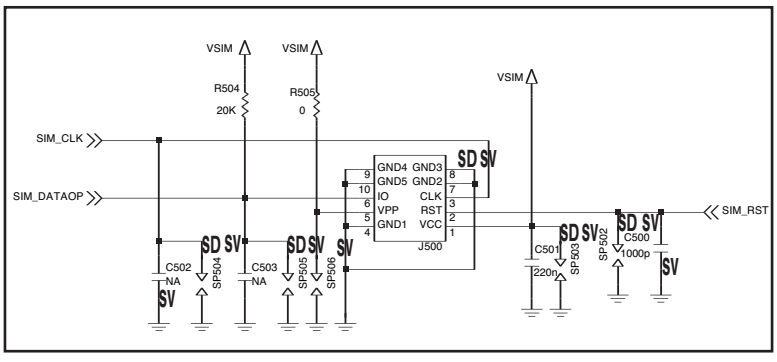
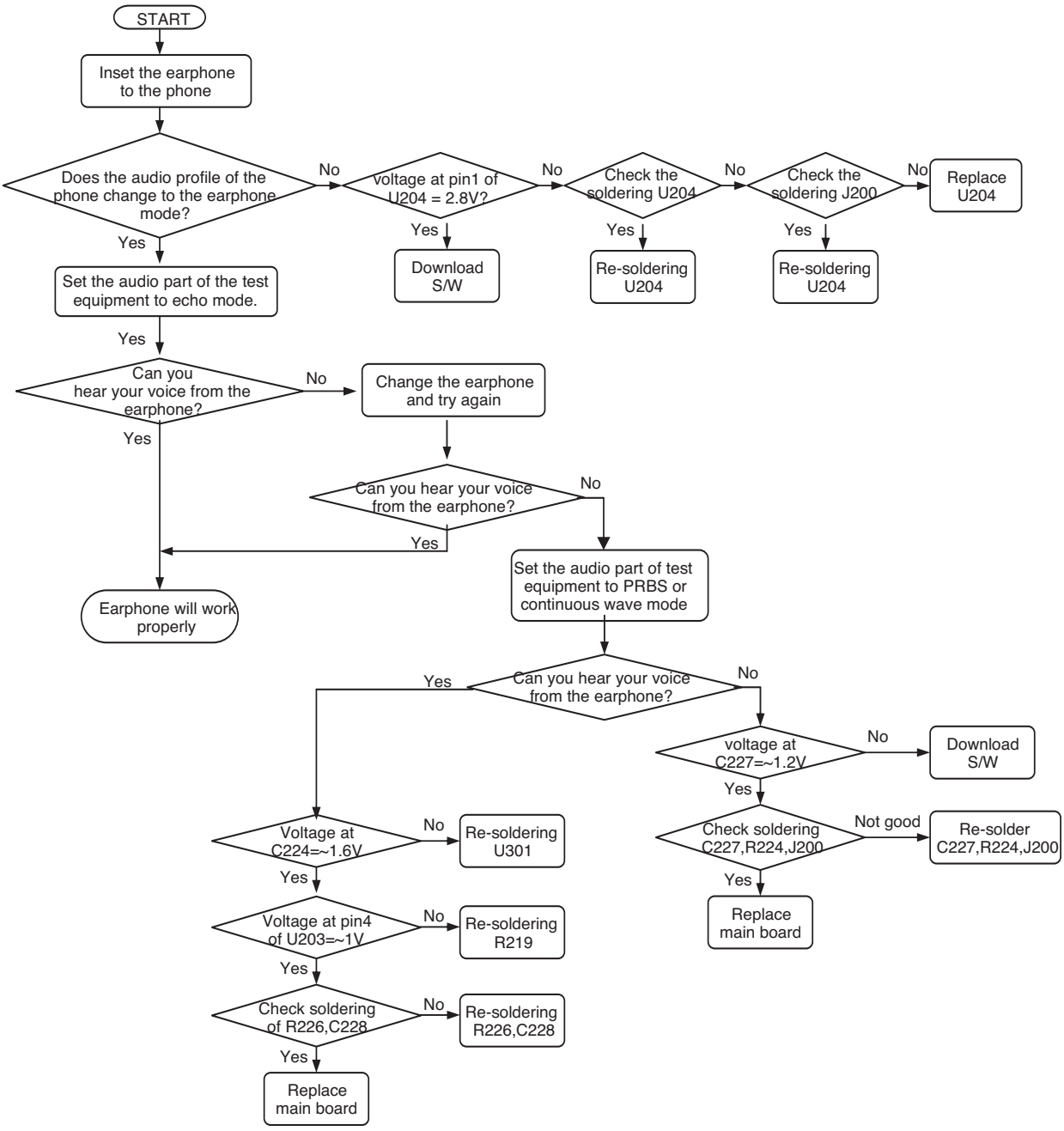


Figure 4-27

4.13 Ear Jack Trouble

SETTING : After Initialize Agilent 8960, Test in EGSM, DCS Mode



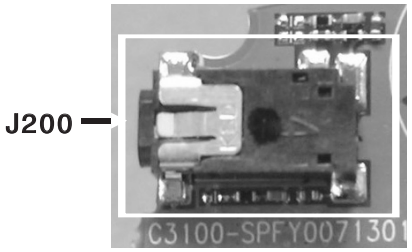


Figure 4-28

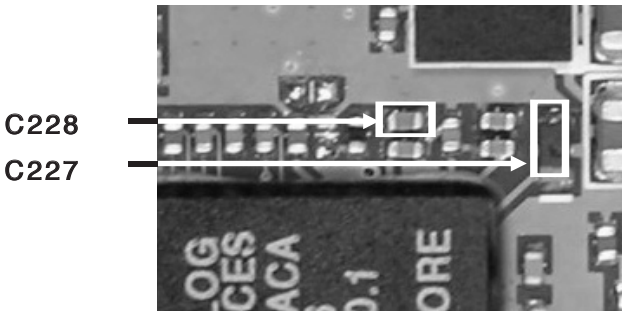


Figure 4-29

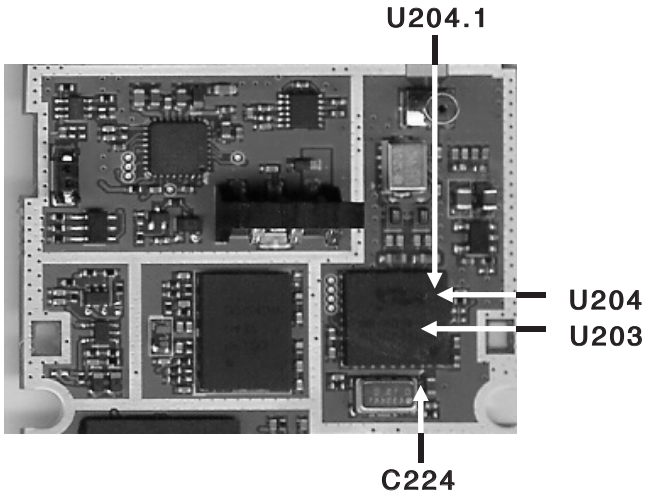
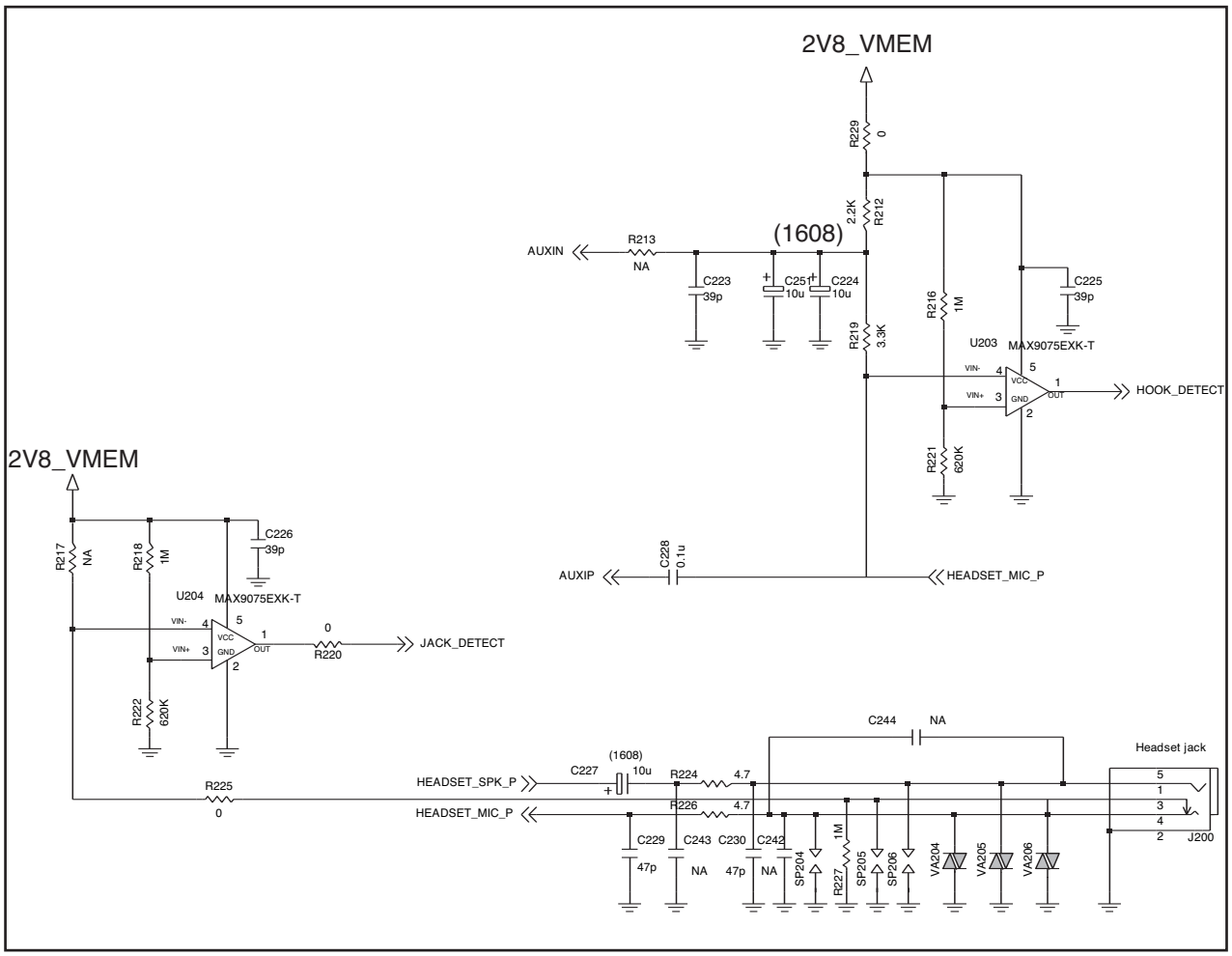


Figure 4-30



4.14 Bluetooth Trouble

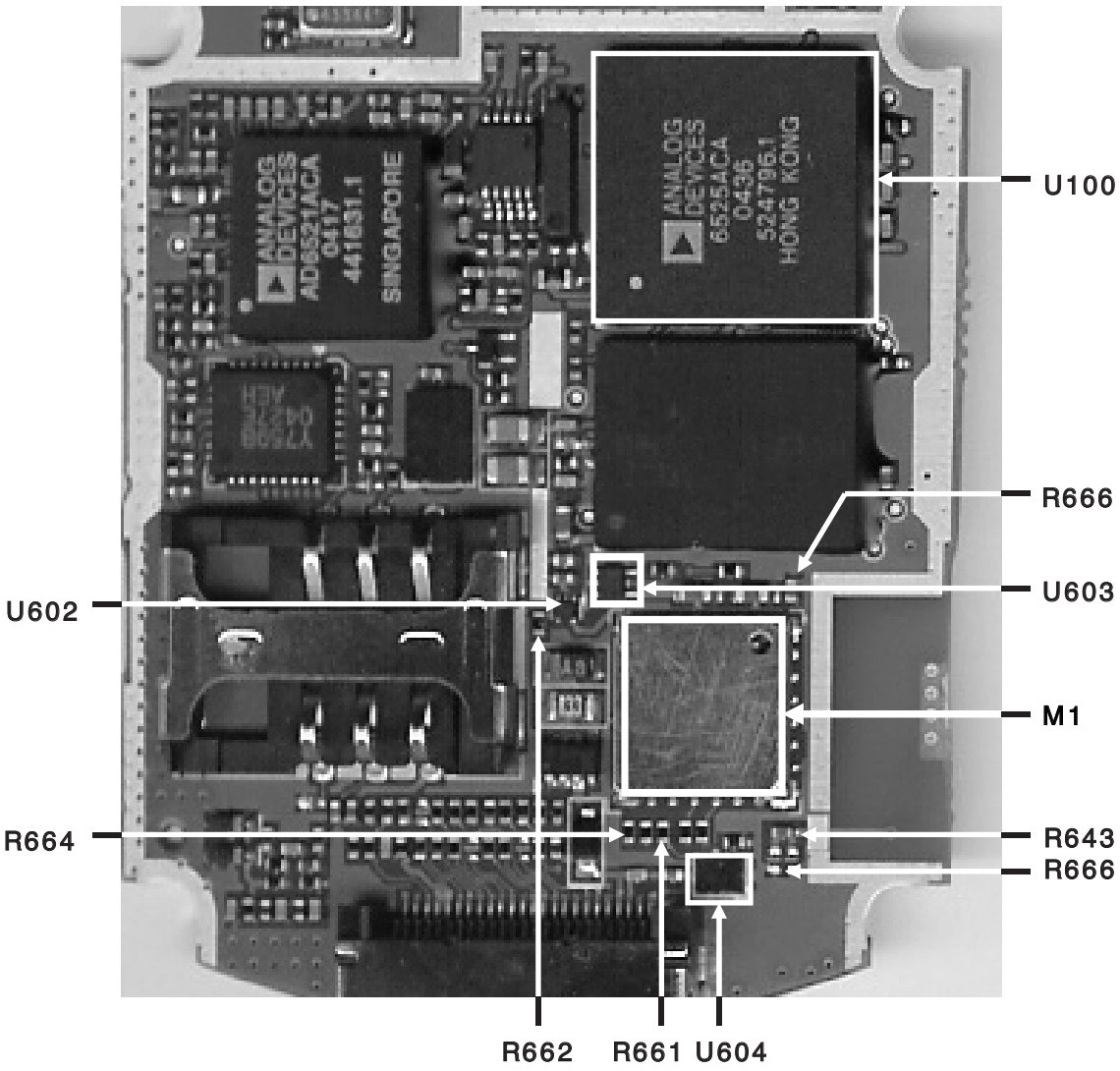
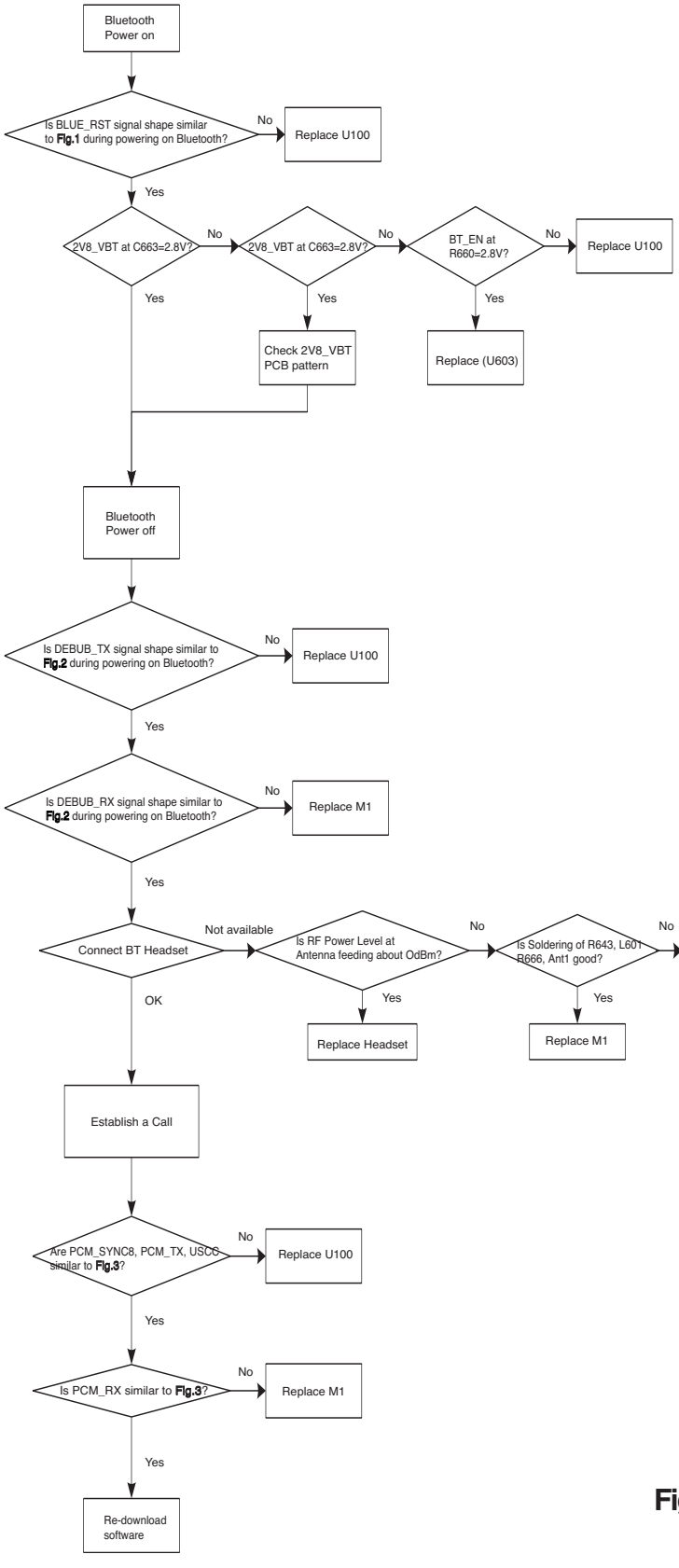


Figure 4-31



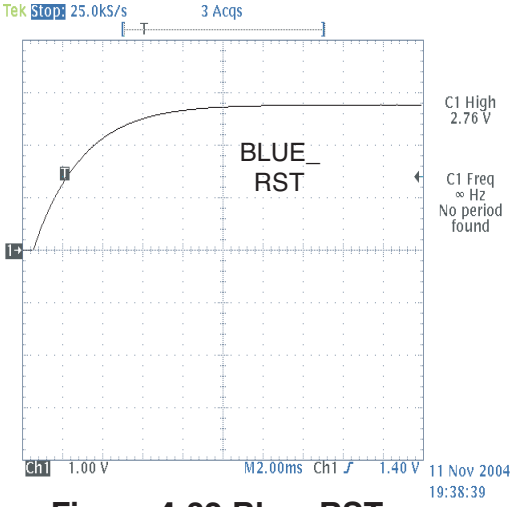


Figure 4-32 Blue_RST

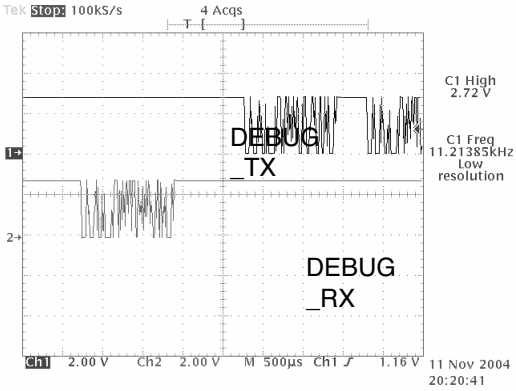


Figure 4-33 DEBUG_Tx, Rx

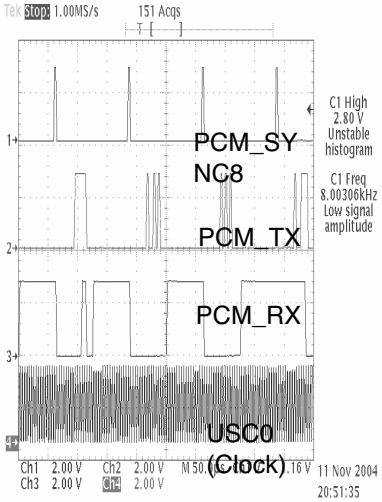


Figure 4-34 PCM_SYNCS, Tx, Rx, USC0

5. DISASSEMBLY INSTRUCTION

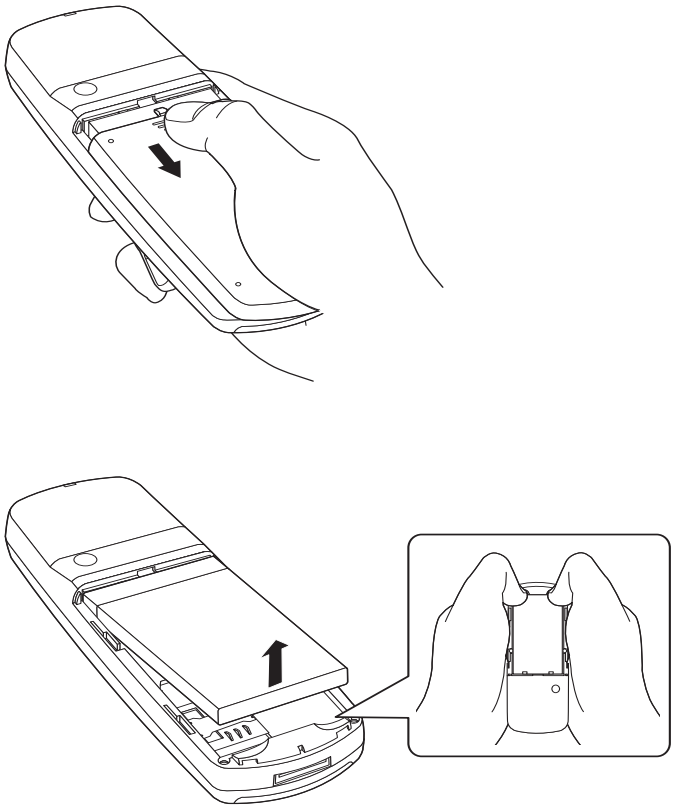


Figure 5-1

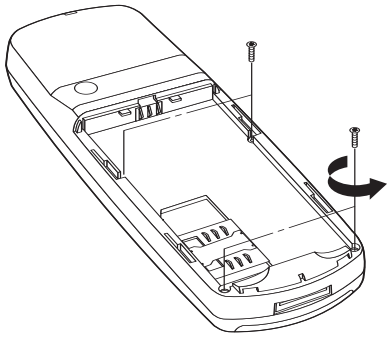


Figure 5-2

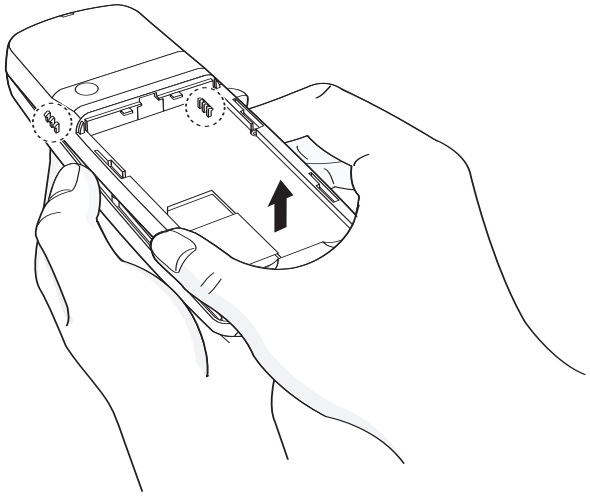


Figure 5-3

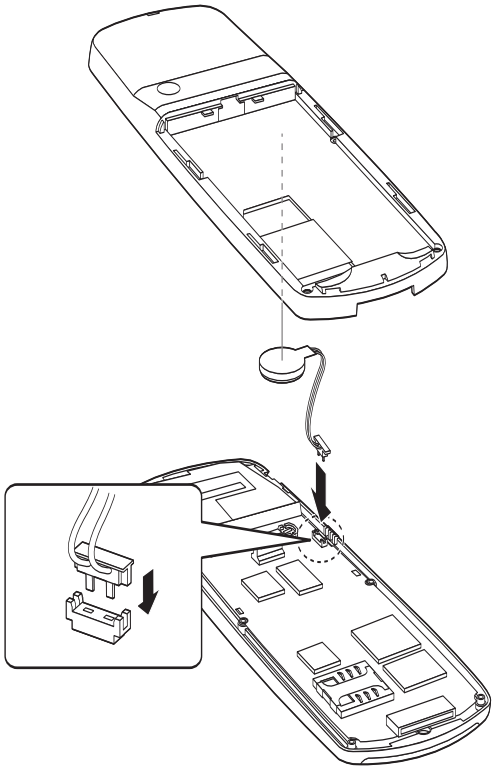


Figure 5-4

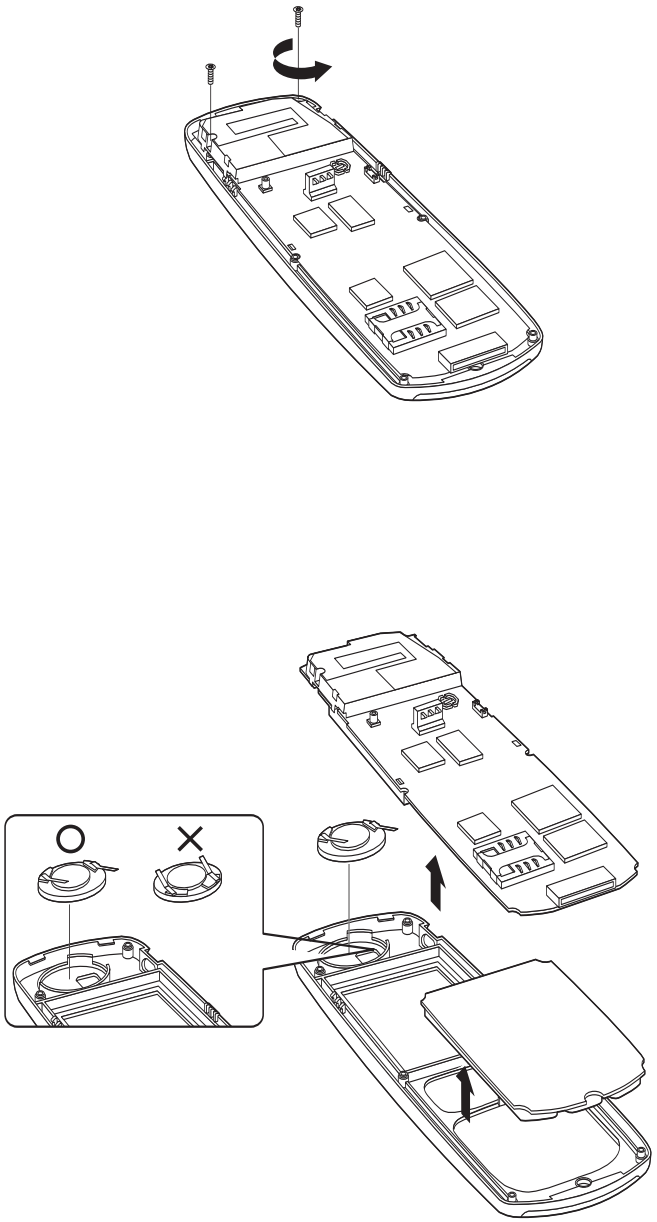


Figure 5-5

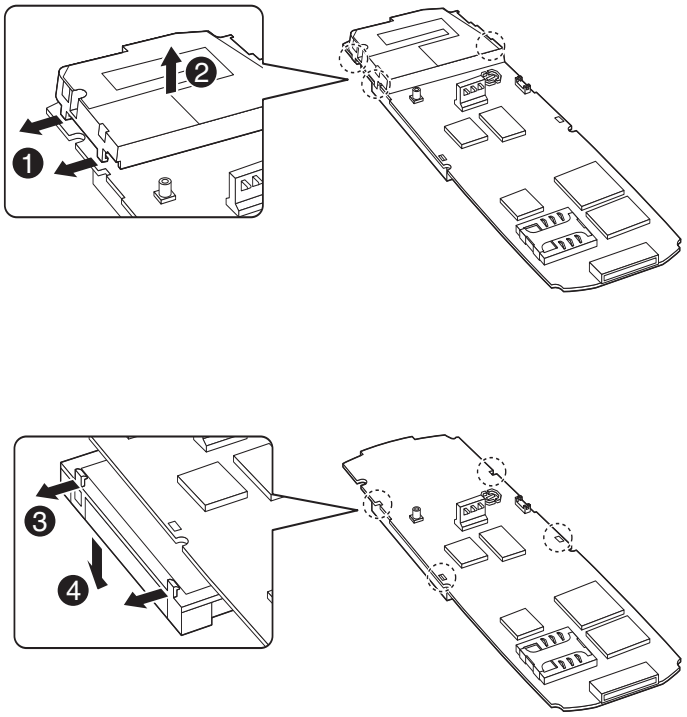


Figure 5-6

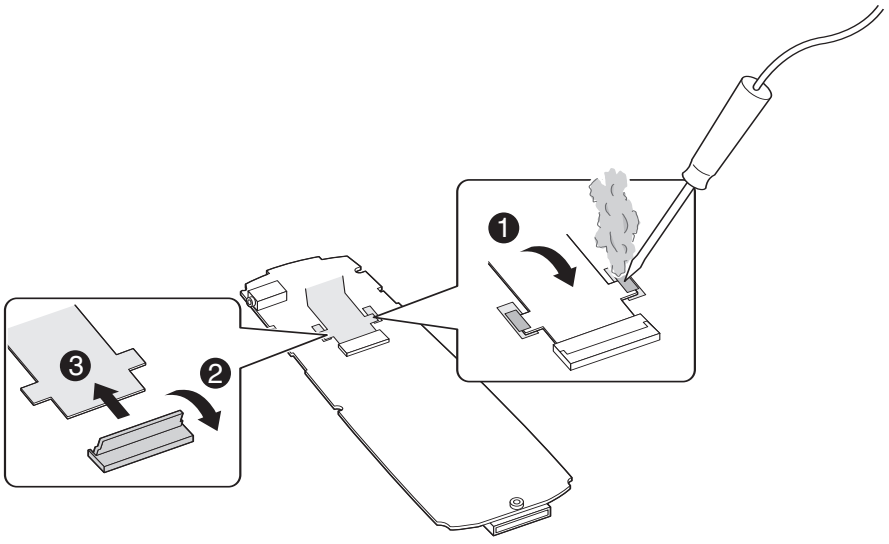


Figure 5-7

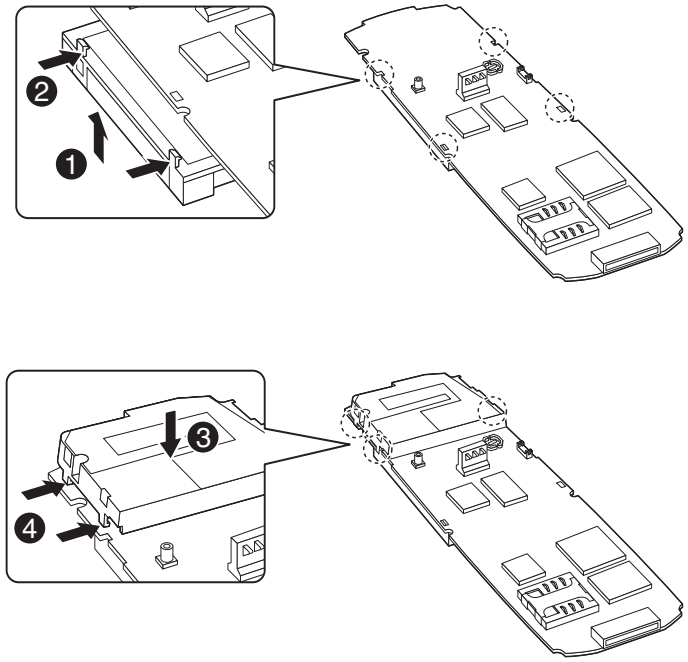


Figure 5-8

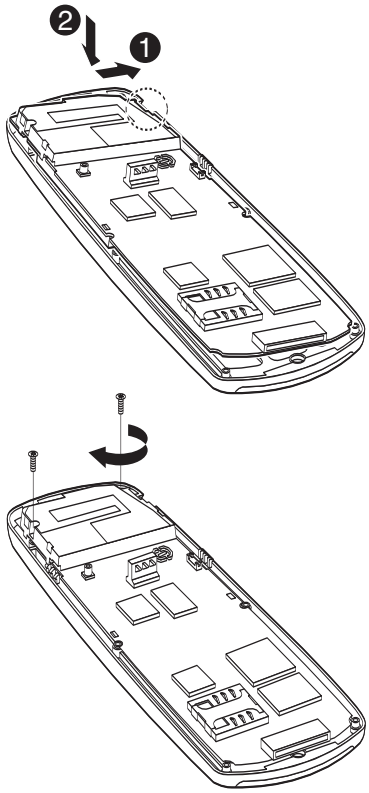


Figure 5-9

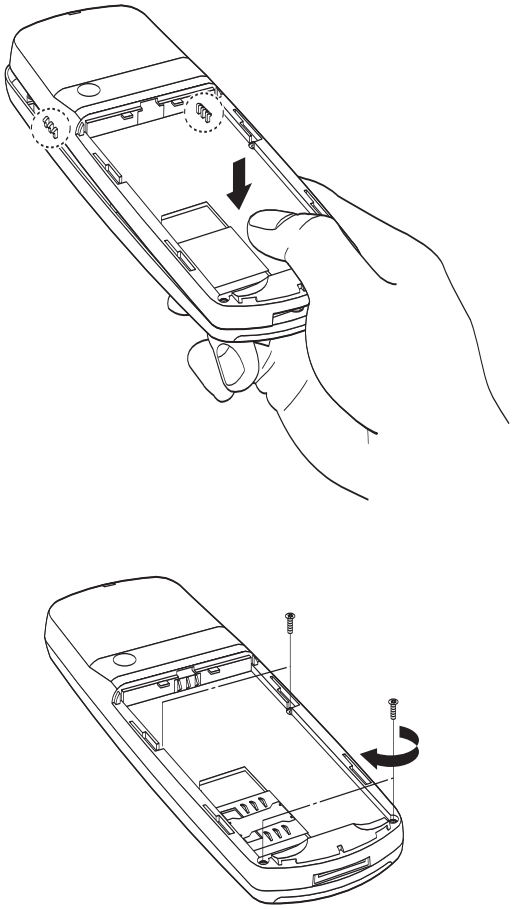


Figure 5-10

6. DOWNLOAD AND CALIBRATION

6.1 Download

A. Download Setup

Figure 6-1 describes Download setup

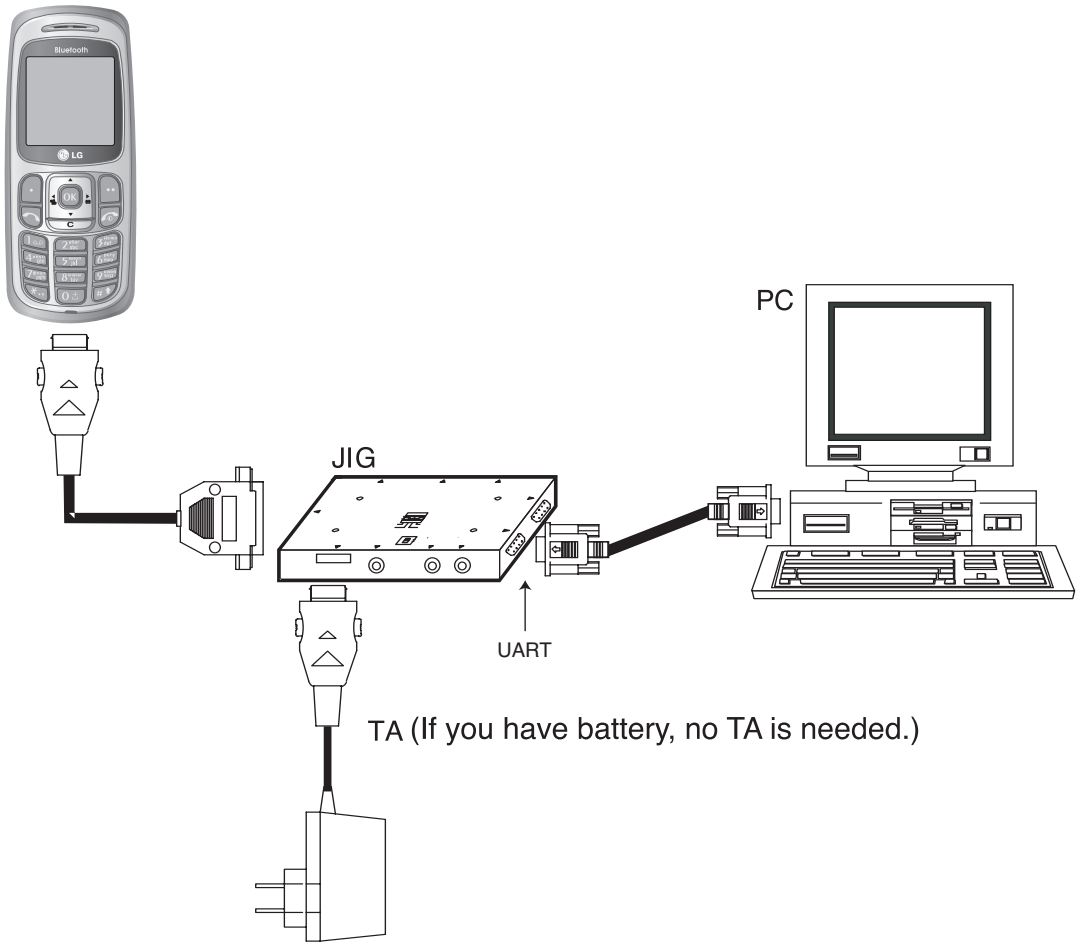
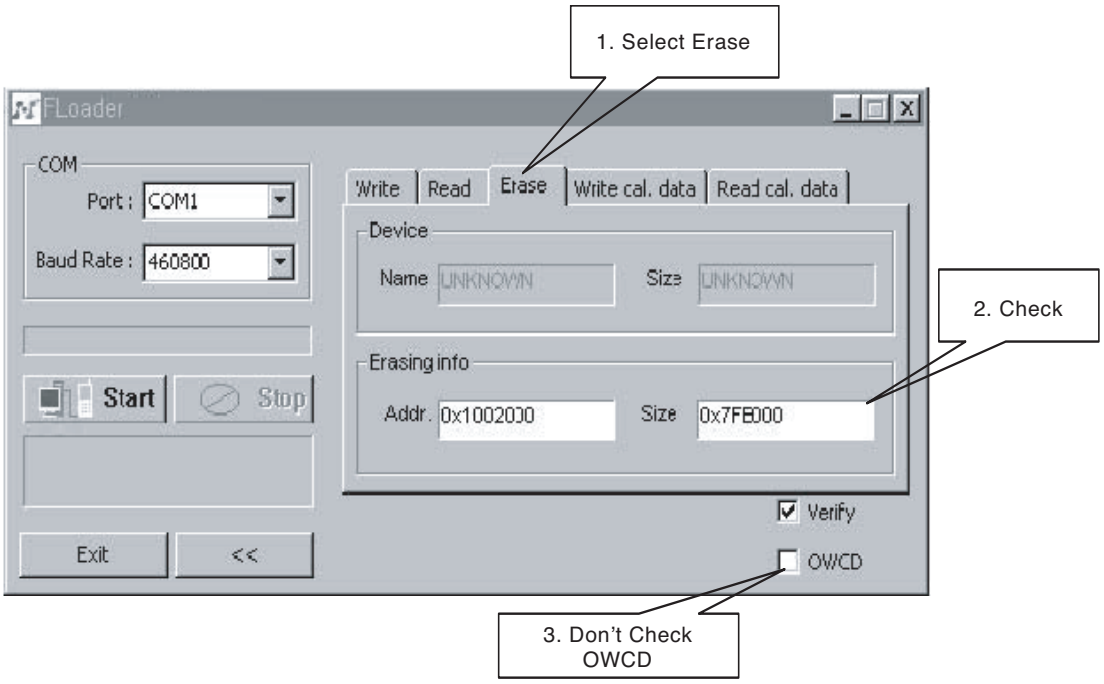


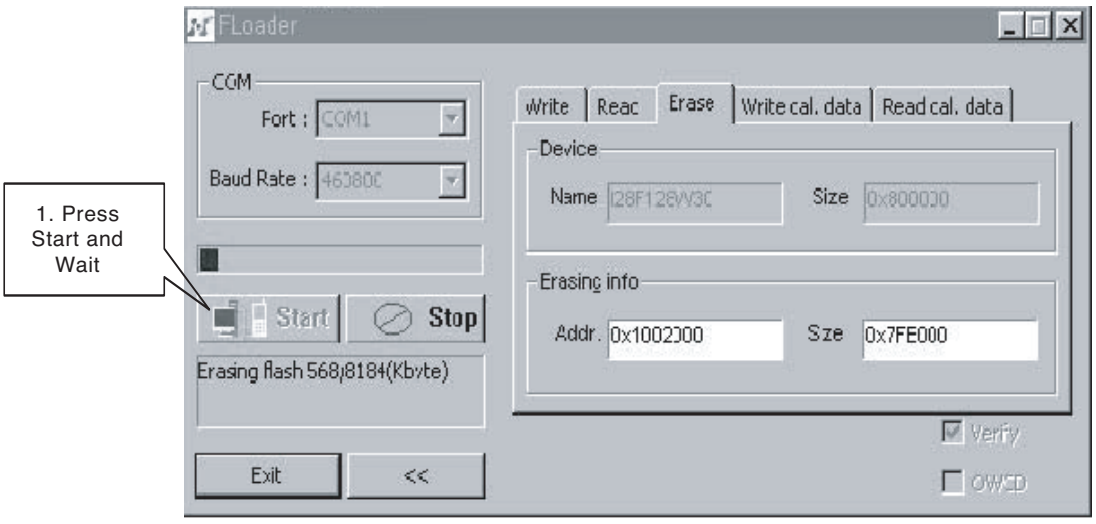
Figure 6-1 Download Setup

B. Download Procedure

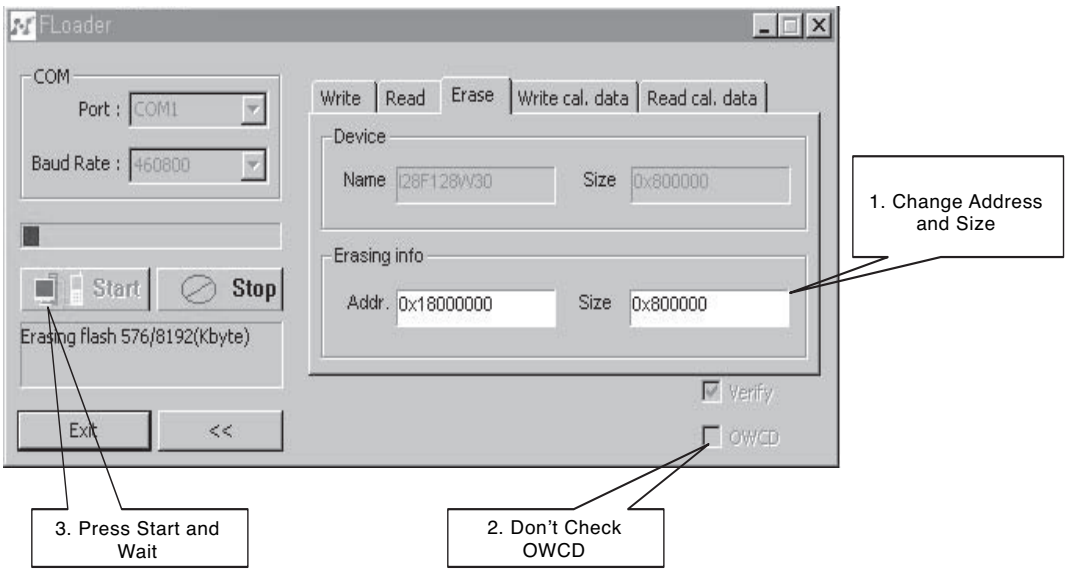
1. Access Flash loader program in PC and select Erase. (Don't check OWCD)



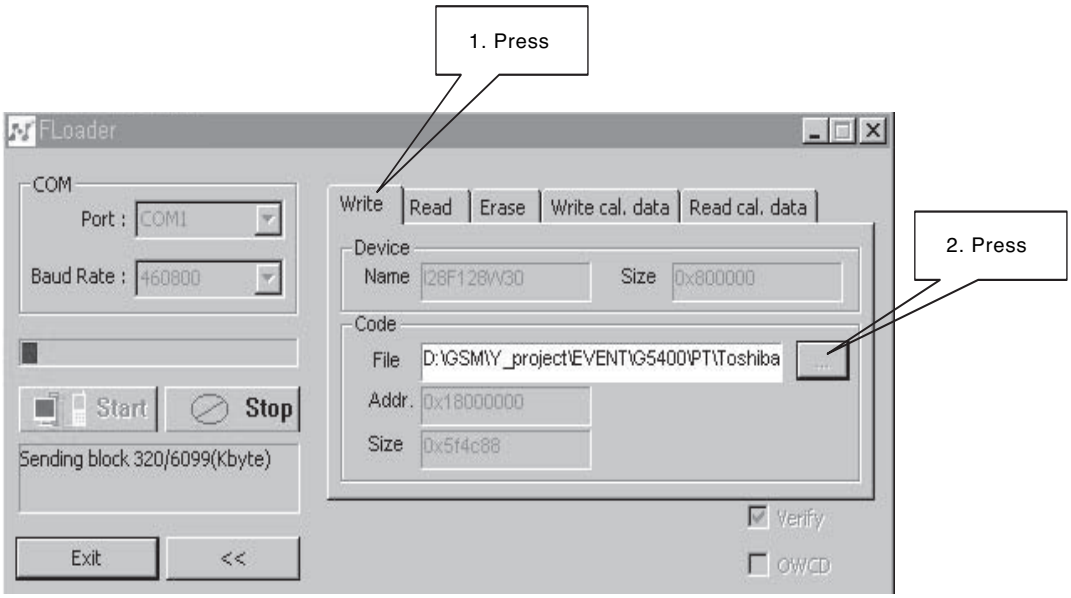
2. Press Start and Wait until Erase is completed.



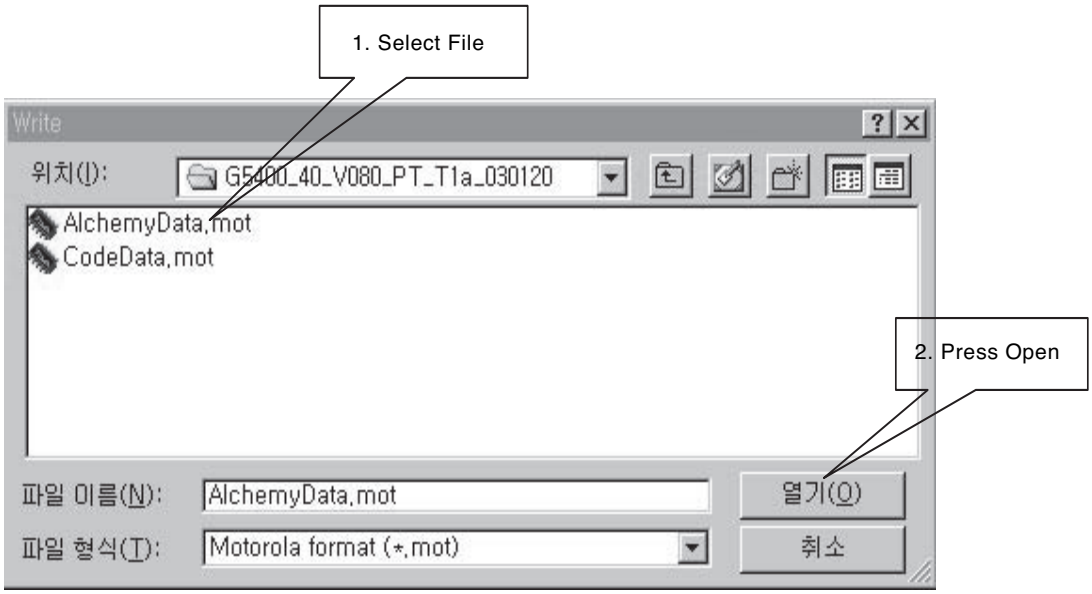
3. Change Address and Size (Address : 18000000, Size : 0x800000), and Press Start and Wait until Erase is completed again (Alchemy 8W8Cerase)



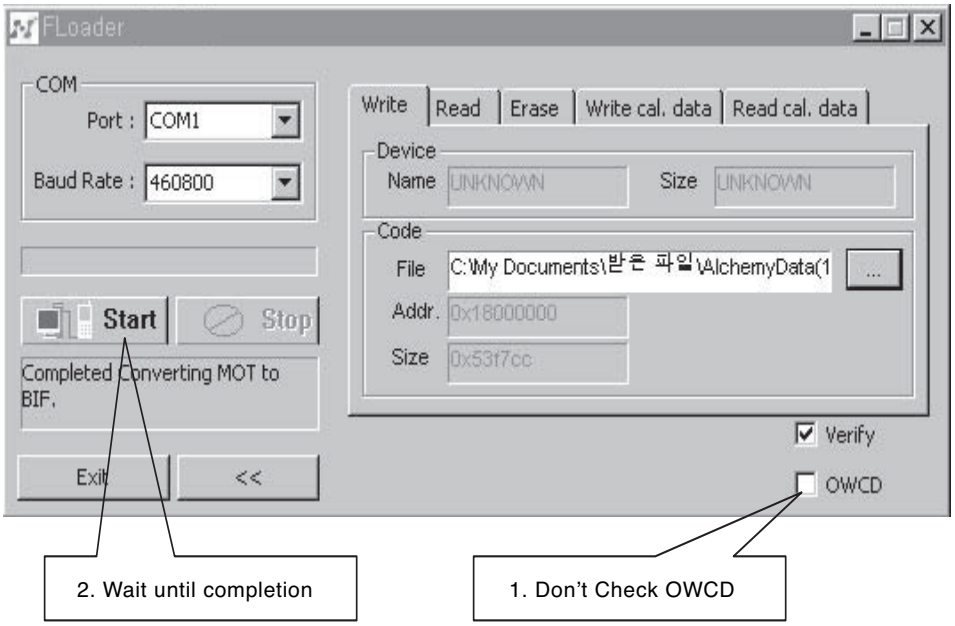
4. Press Write to start Download and press [...] Key to choose software (AlchemyData.mot)



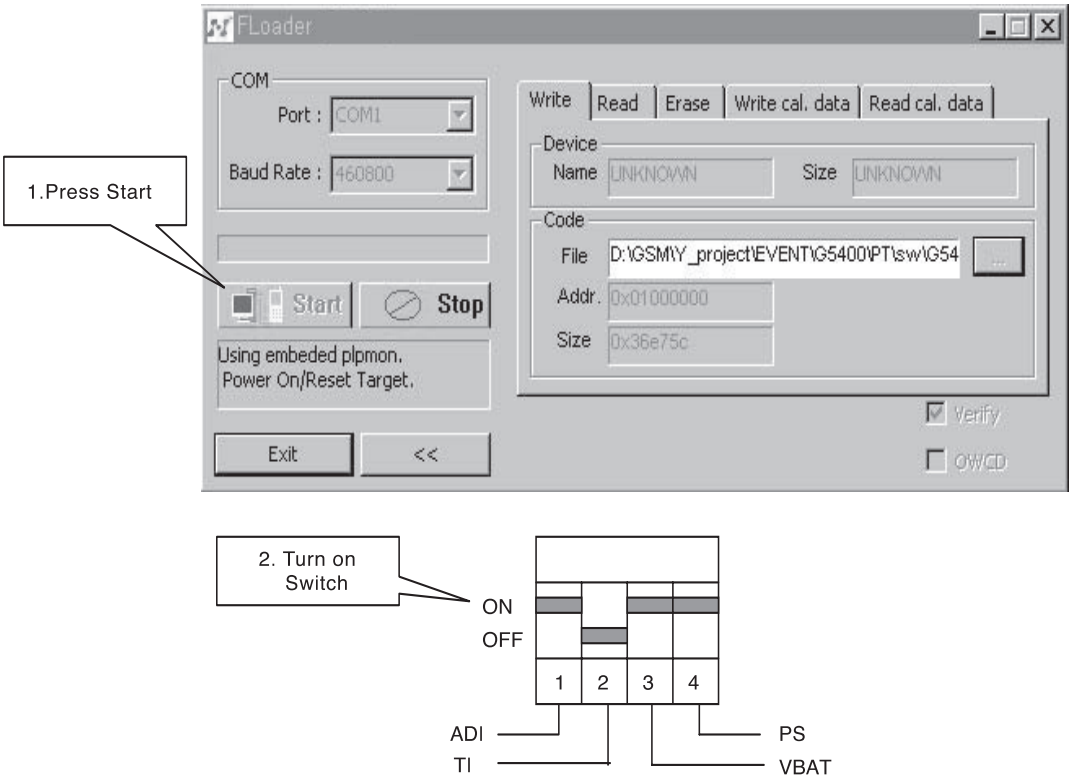
5. Choose software



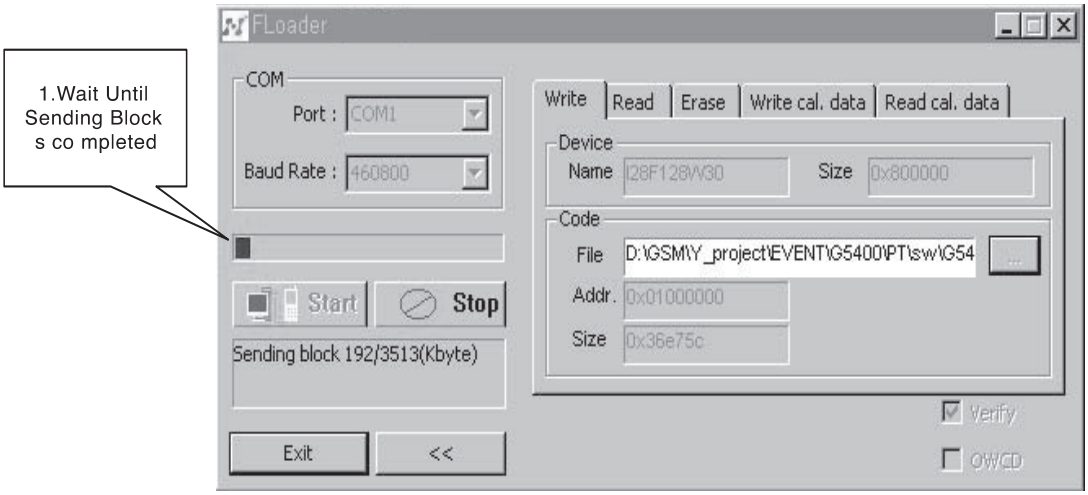
6. Wait until converting from MOT to BIF is completed (Don't check OWCD)



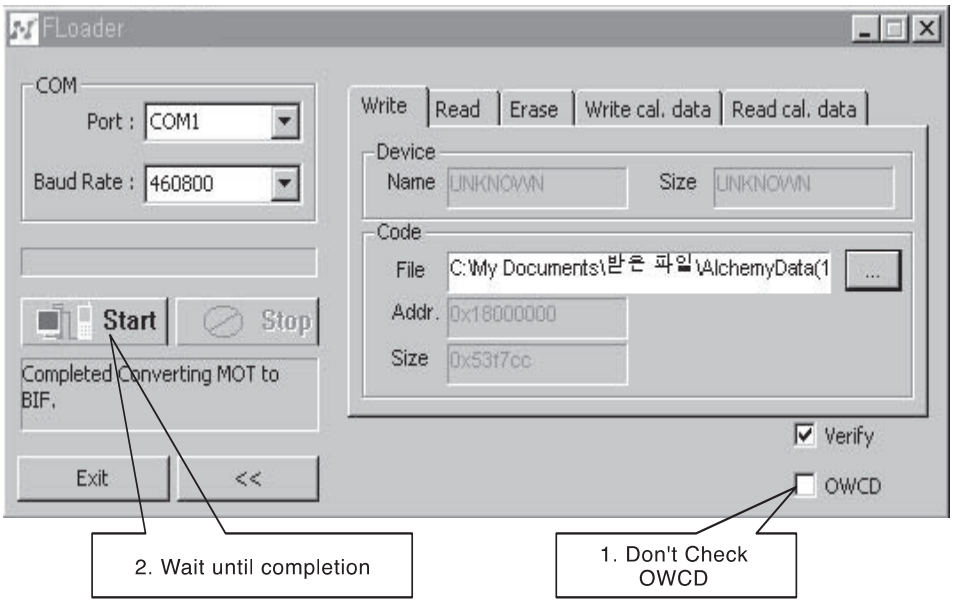
7. Press Start and Power on the phone using JIG remote Power on (Switch 1)



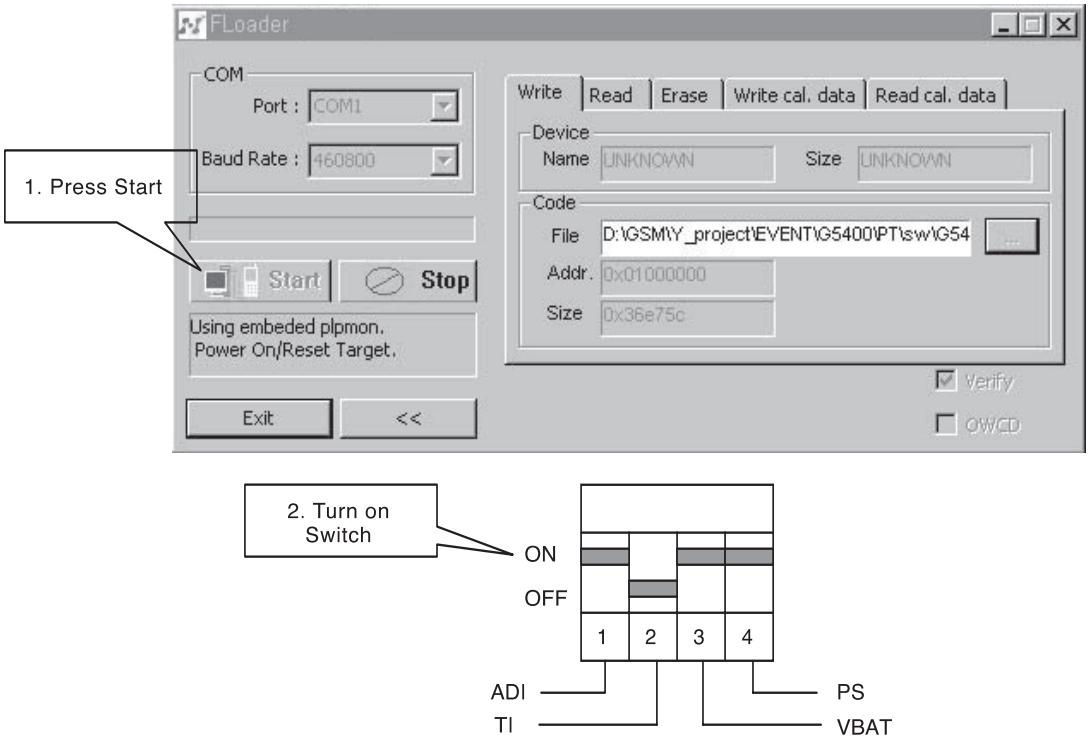
8. Wait until Sending Block is completed



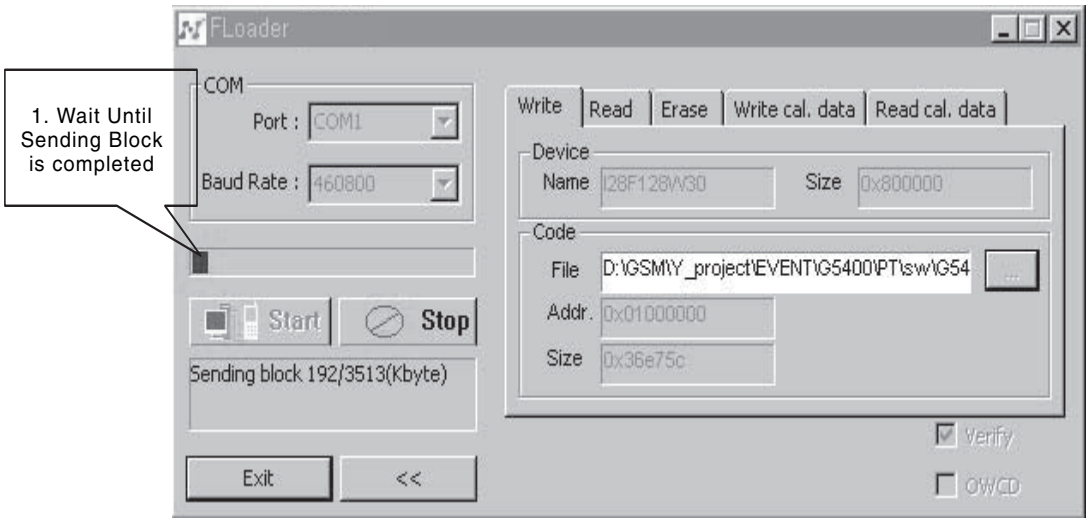
9. Press Write to start Download and press [...] Key to choose software (CodeData.mot)



10. Choose software



11. Wait until Sending Block is completed

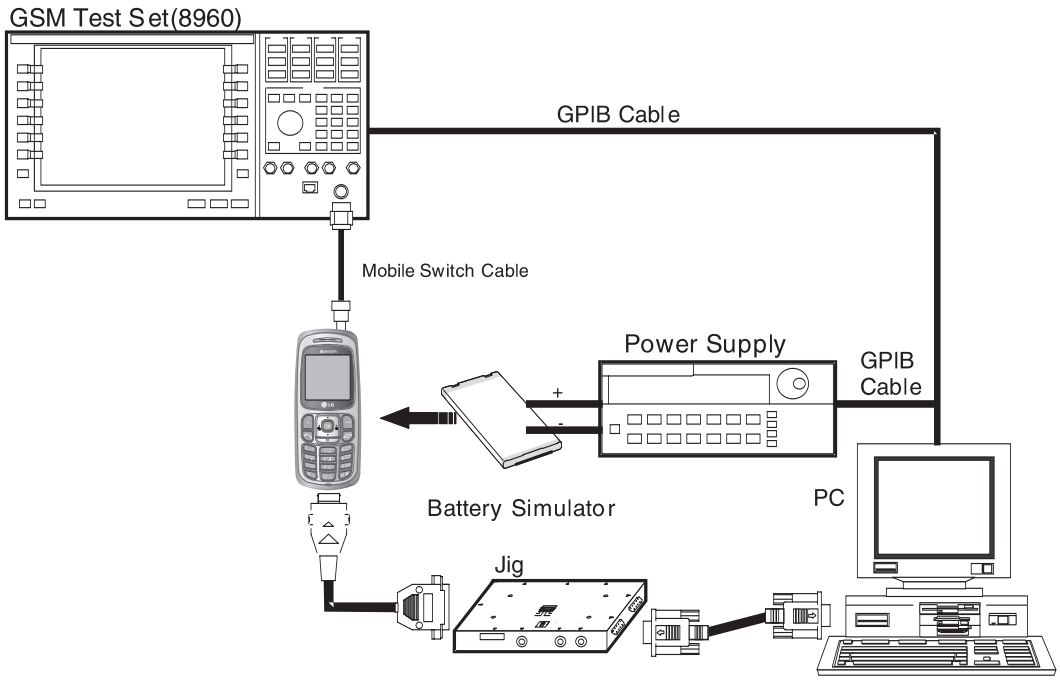


6.2 Calibration

A. Equipment List

Table 6-1 Calibration Equipment List

Equipment for Calibration	Type/Model	Brand
Wireless Communication Test Set	HP-8960	Agilent
RS-232 Cable and Test JIG		LG
RF Cable		LG
Power Supply	HP-66311B	Agilent
GPIB interface card	HP-GPIB	Agilent
Calibration & Final test software		LG
Test SIM Card		
PC (for Software Installation)	Pentium II class above 300MHz	



B. Equipment Setup

Figure 6-2

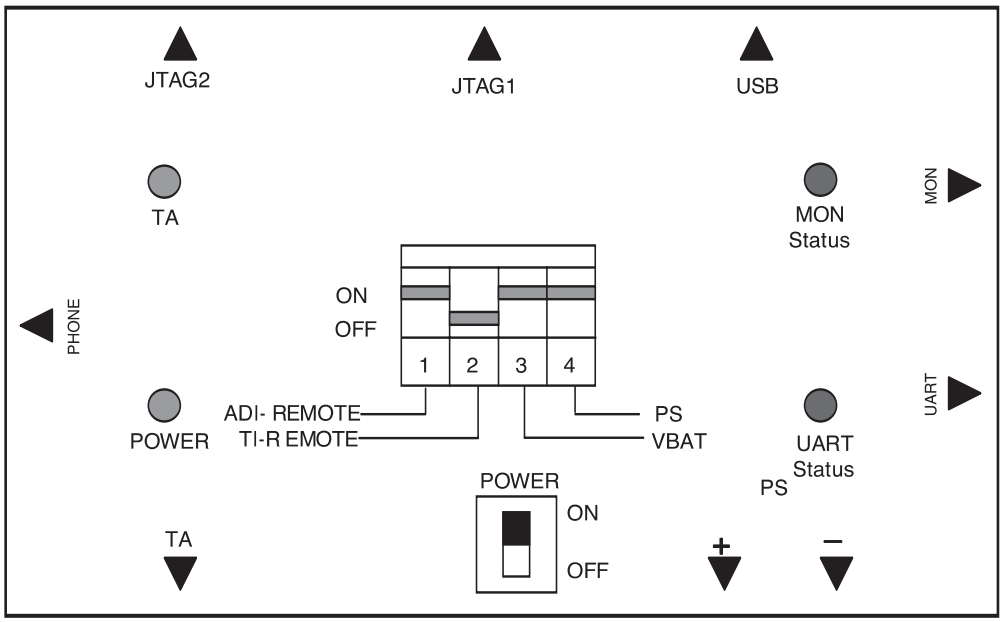


Figure 6-3 The top view of Test JIG

C. Test Jig Operation

Table 6-2 Calibration Equipment List

Power Source	Description
Power Supply	usually 4.0V
Travel Adaptor	Use TA, name is TA-20G (24pin)

Table 6-3 Calibration Equipment List

Switch Number	Name	Description
Switch 1	ADI-REMOTE	In ON state, phone is awaked. It is used ADI chipset.
Switch 2	TI-REMOTE	In ON state, phone is awaked. It is used TI chipset.
Switch 3	VBAT	Power is provided for phone from battery
Switch 4	PS	Power is provided for phone from Power supply

Table 6-4 Calibration Equipment List

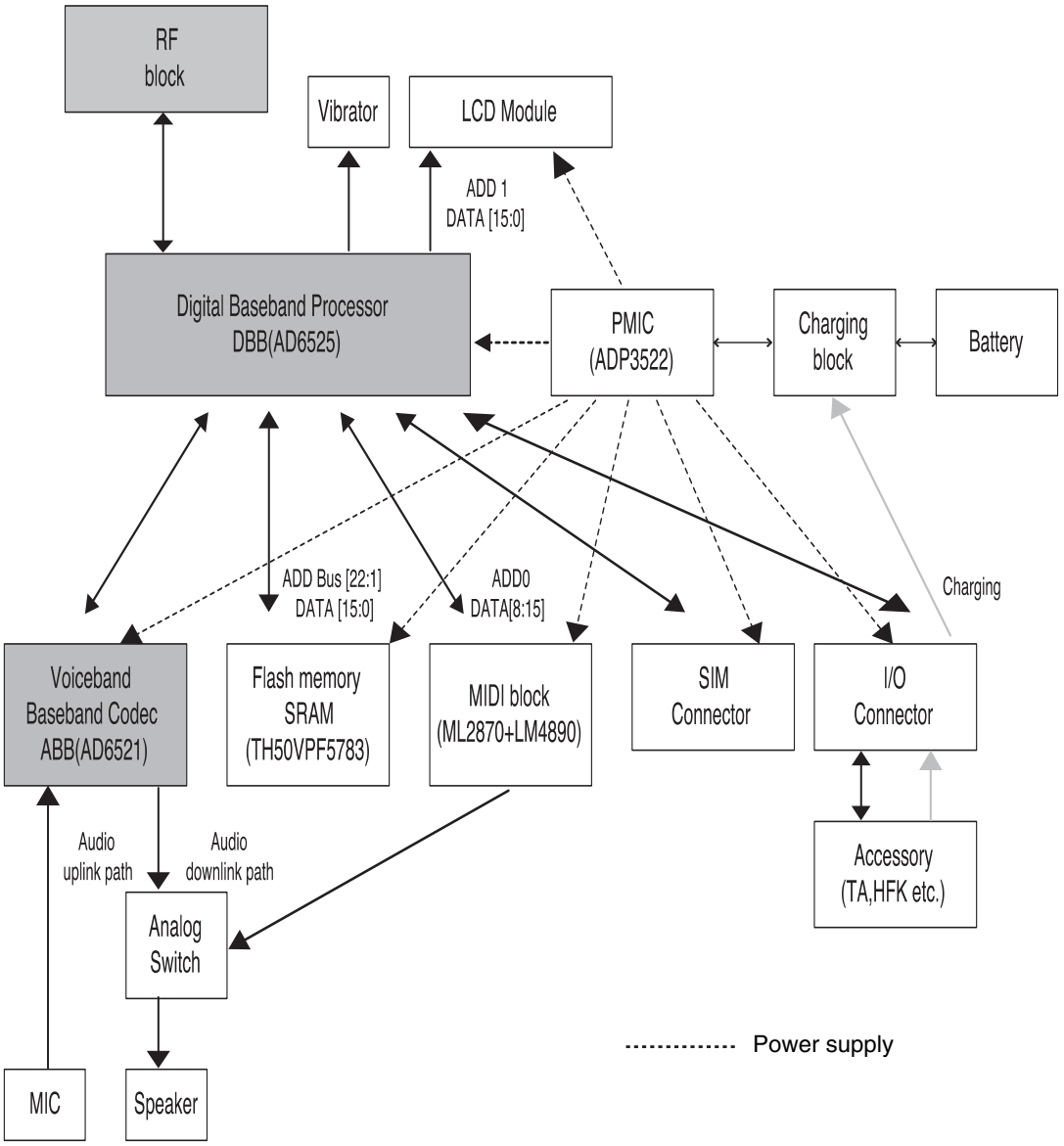
LED Number	Name	Description
LED 1	Power	Power is provided for Test Jig.
LED 2	TA	Indicate charging state of the phone battery
LED 3	UART	Indicate data transfer state through the UART port
LED 4	MON	Indicate data transfer state through the MON port

1. Connect as Fig 6-2 (RS232 serial cable is connected between COM port of PC and MON port of TEST JIG, in general)
2. Set the Power Supply 4.0V
3. Set the 3 rd , 4 th of DIP SW ON state always
4. Press the Phone power key, if the Remote ON is used, 1 st ON state

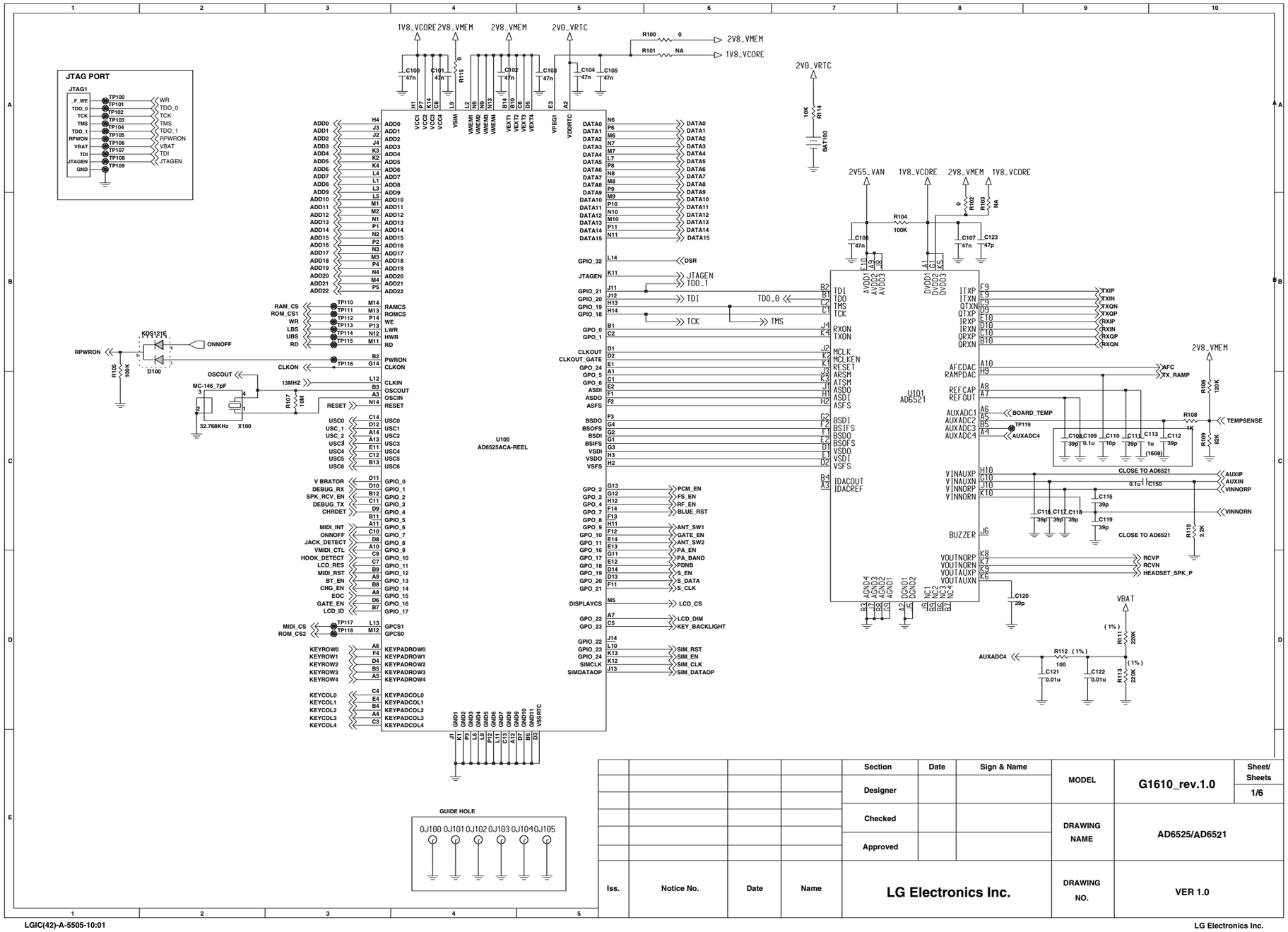
D. Procedure

1. Connect as Fig 6-2 (RS232 serial cable is connected between COM port of PC and MON port of TEST JIG, in general)
2. Power ON PC then enter into Windows 98 (Remark : Windows 2000 system could be feasible)
3. Run AUTOCAL.exe, the AUTOCAL application window will be appeared.

7. BLOCK DIAGRAM

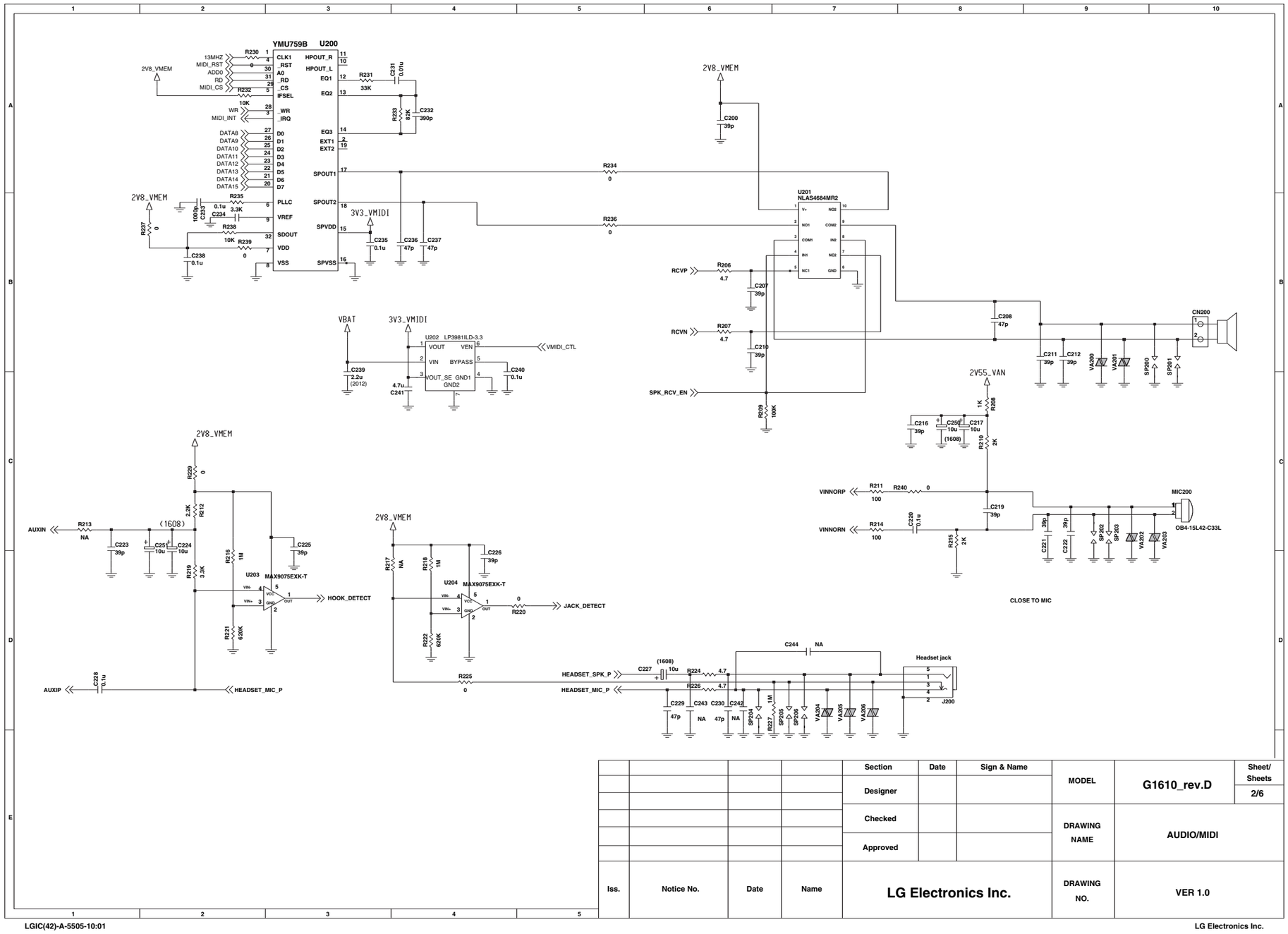


8. CIRCUIT DIAGRAM



LGIC(42)-A-5505-10:01

8. CIRCUIT DIAGRAM

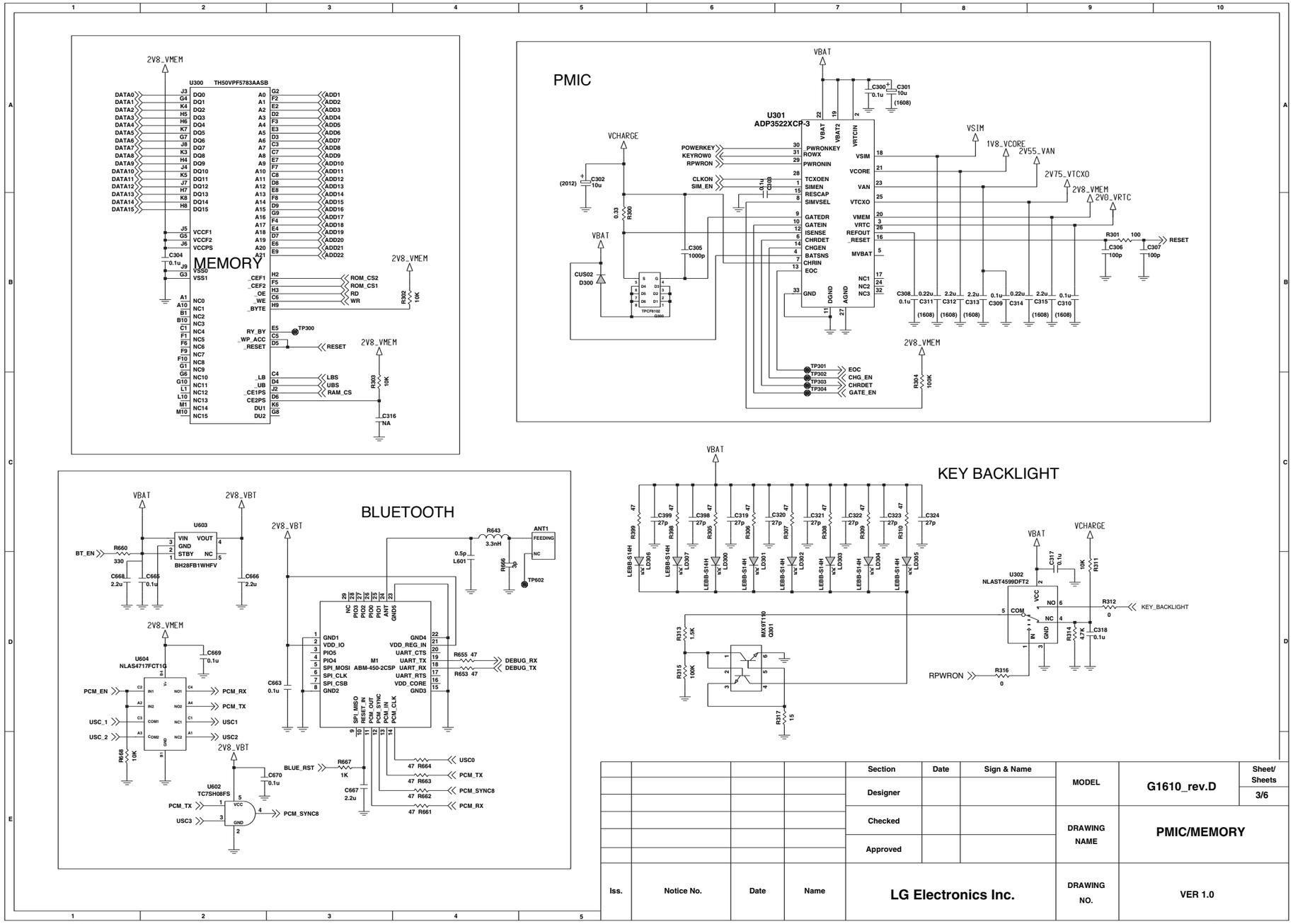


Iss.	Notice No.	Date	Name	Section	Date	Sign & Name	MODEL	G1610_rev.D	Sheet/ Sheets
				Designer					2/6
				Checked			DRAWING NAME	AUDIO/MIDI	
				Approved					
				LG Electronics Inc.			DRAWING NO.	VER 1.0	

LGIC(42)-A-5505-10:01

LG Electronics Inc.

8. CIRCUIT DIAGRAM



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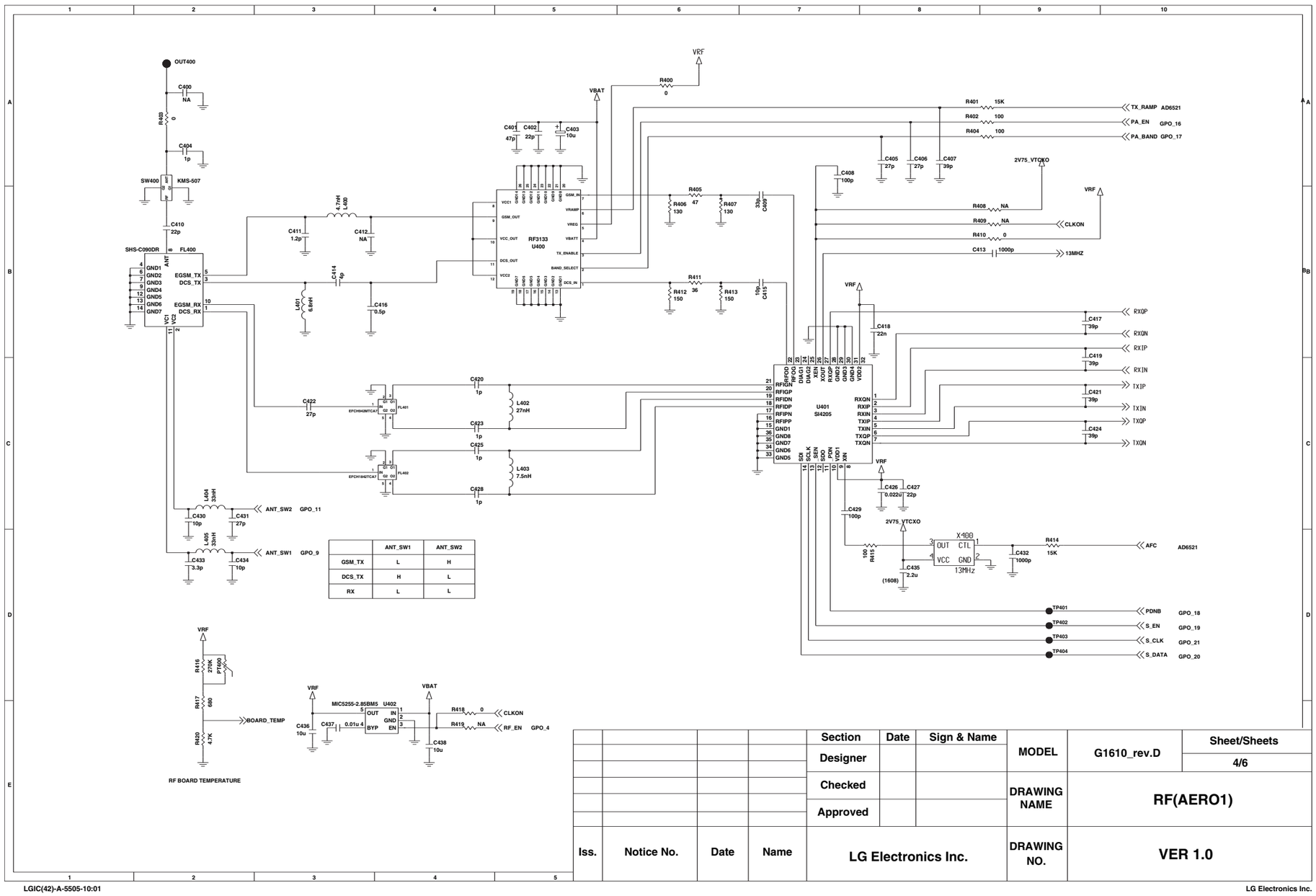
				Designer					3/6
				Checked			DRAWING NAME	PMIC/MEMORY	
				Approved					
Iss.	Notice No.	Date	Name	LG Electronics Inc.			DRAWING NO.	VER 1.0	

LGIC(42)-A-5505-10:01

LG Electronics Inc.

8. CIRCUIT DIAGRAM



	ANT_SW1	ANT_SW2
GSM_TX	L	H
DCS_TX	H	L
RX	L	L

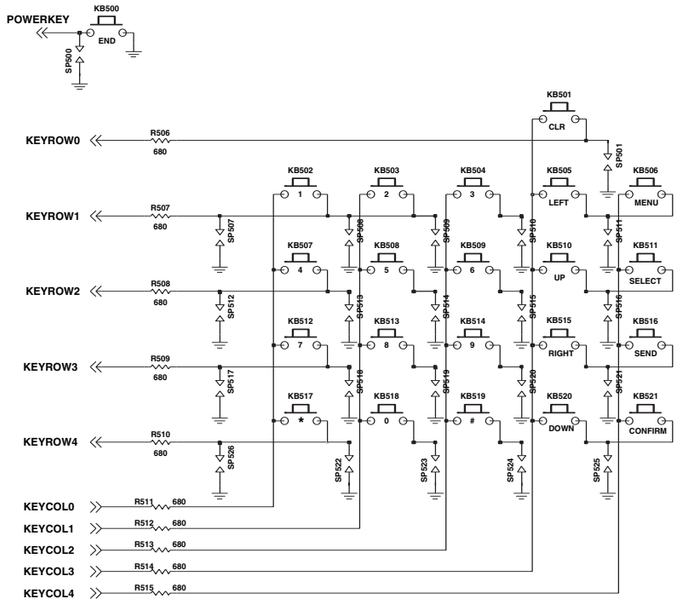
				Section	Date	Sign & Name	MODEL	G1610_rev.D	Sheet/Sheets
				Designer					4/6
				Checked			DRAWING NAME	RF(AERO1)	
				Approved					
Iss.	Notice No.	Date	Name	LG Electronics Inc.			DRAWING NO.	VER 1.0	

LGIC(42)-A-5505-10:01

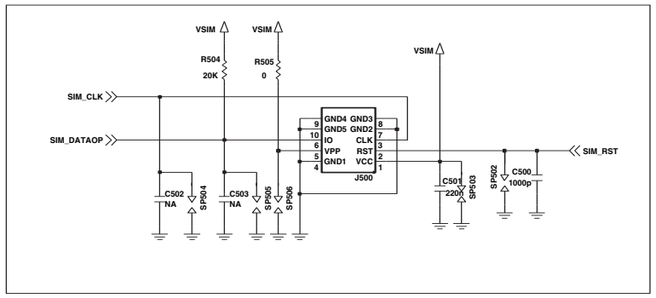
LG Electronics Inc.

8. CIRCUIT DIAGRAM

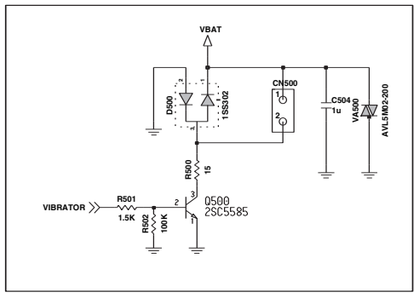
KEYPAD



SIM CONNECTOR



VIBRATOR

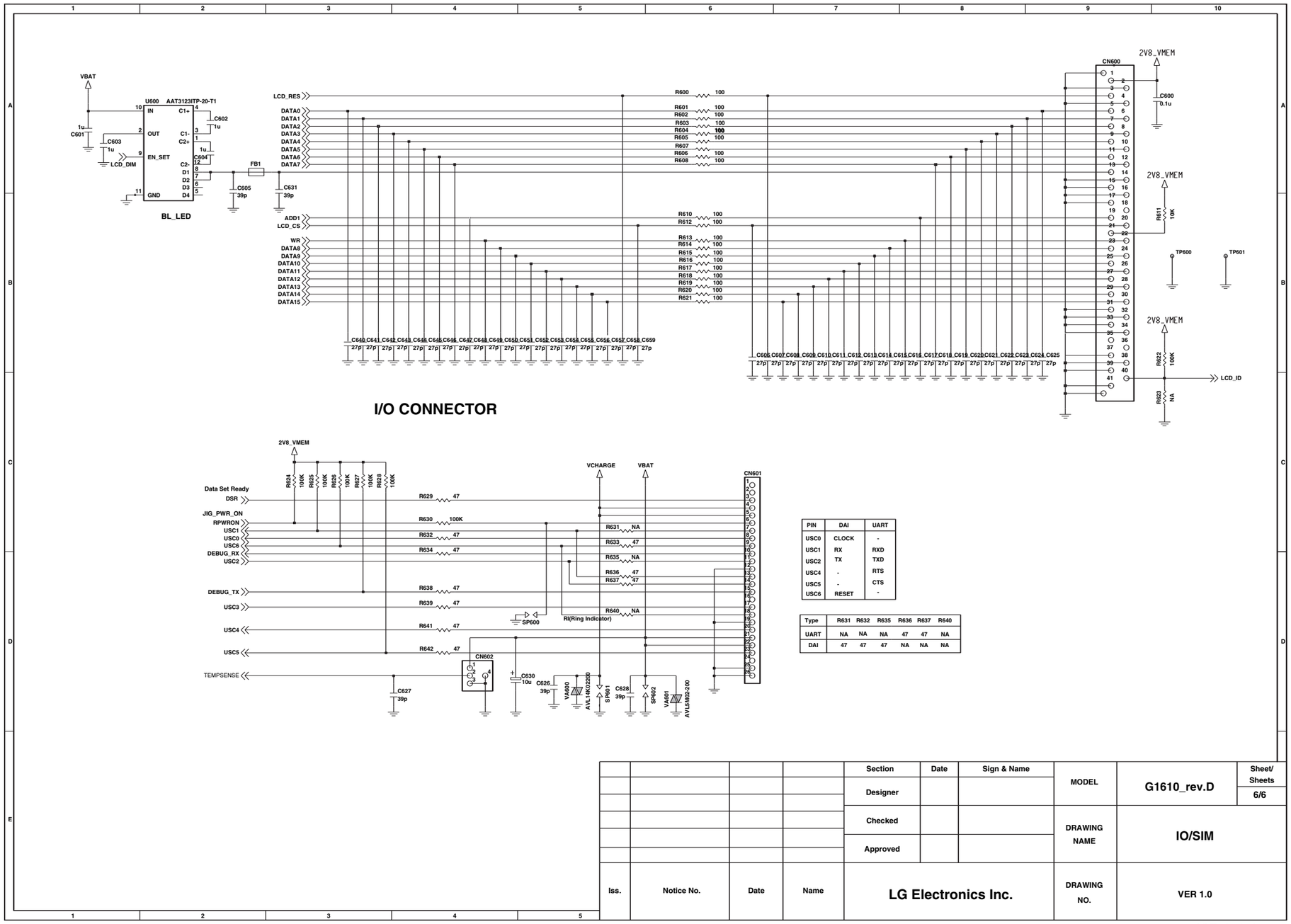


				Section	Date	Sign & Name	MODEL	G1610_rev.D	Sheet/ Sheets
				Designer					5/6
				Checked			DRAWING NAME	SIM/KEYPAD/VIBRATOR	
				Approved					
Iss.	Notice No.	Date	Name	LG Electronics Inc.			DRAWING NO.	VER 1.0	

LGIC(42)-A-5505-10:01

LG Electronics Inc.

8. CIRCUIT DIAGRAM



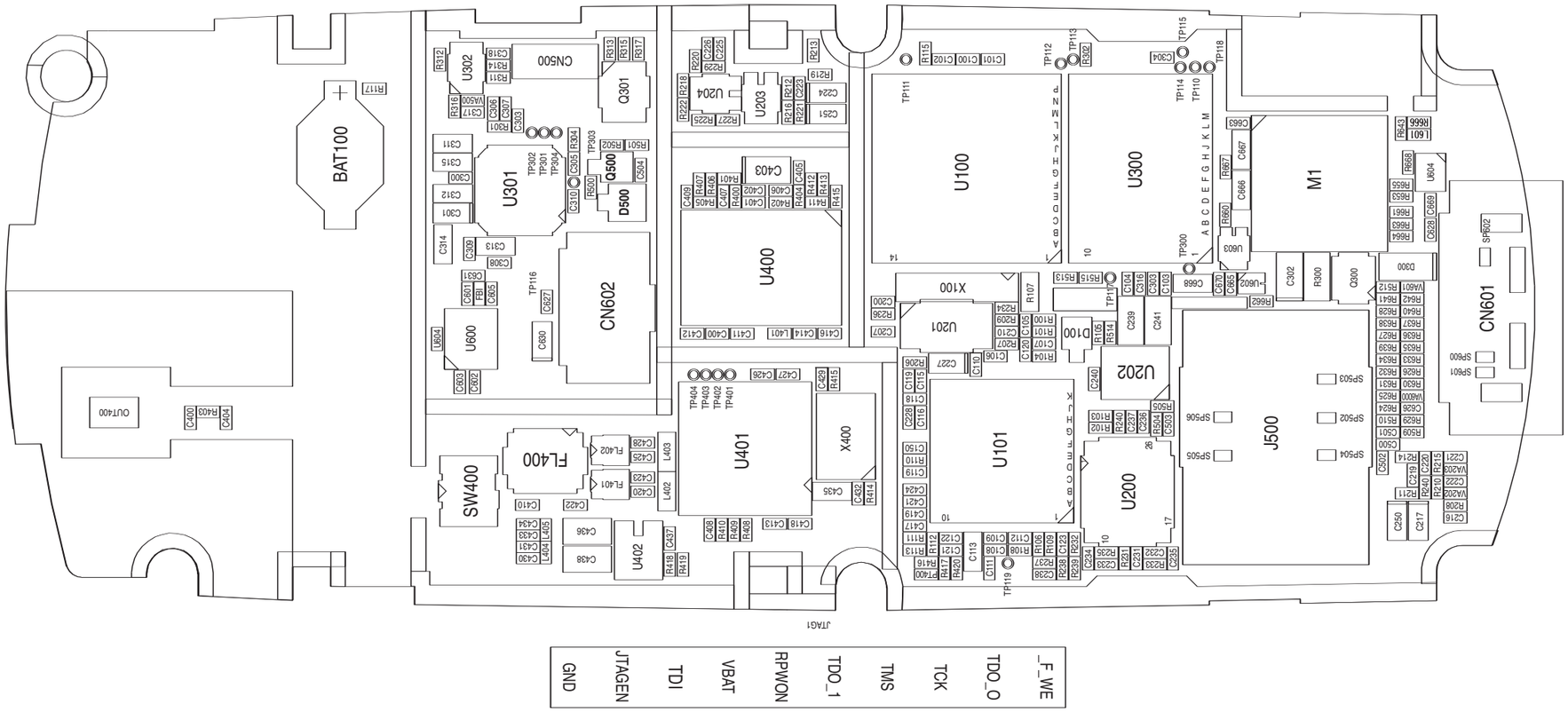
PIN	DAI	UART
USC0	CLOCK	-
USC1	RX	RXD
USC2	TX	TXD
USC4	-	RTS
USC5	-	CTS
USC6	RESET	-

Type	R631	R632	R635	R636	R637	R640
UART	NA	NA	NA	47	47	NA
DAI	47	47	47	NA	NA	NA

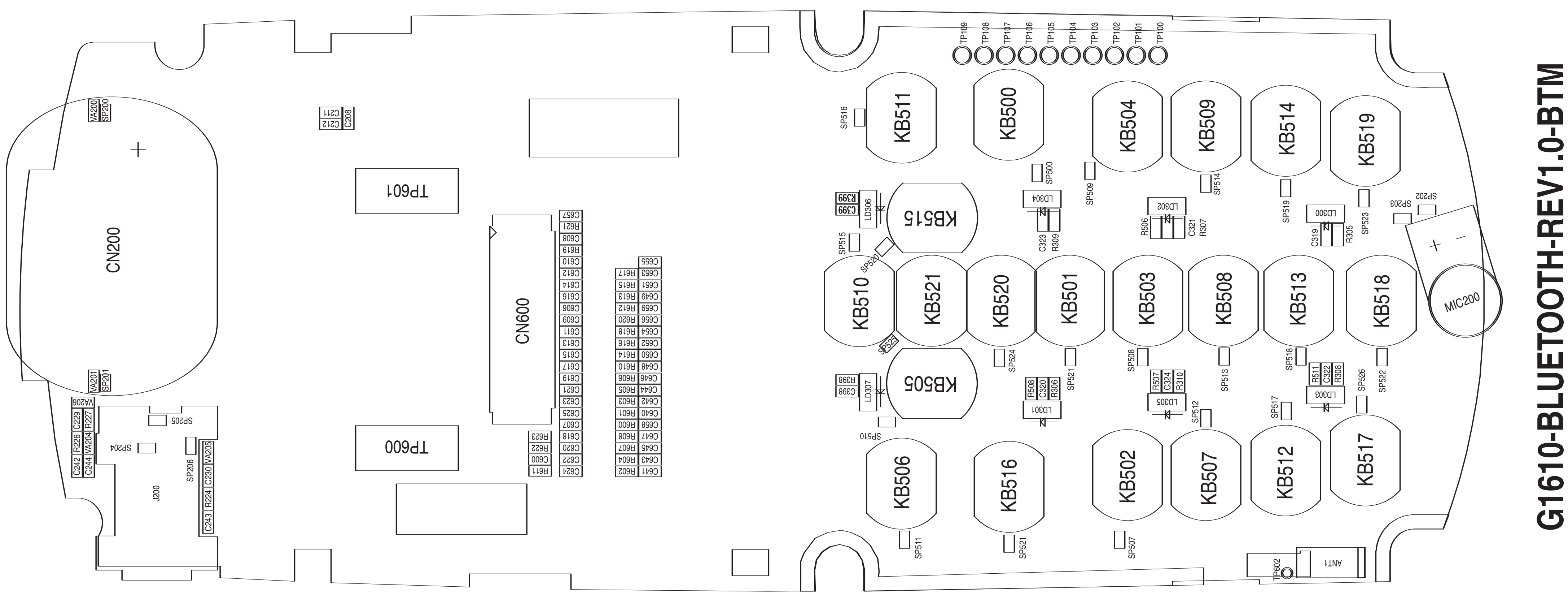
				Section	Date	Sign & Name	MODEL	G1610_rev.D	Sheet/ Sheets
				Designer					6/6
				Checked			DRAWING NAME	IO/SIM	
				Approved					
Iss.	Notice No.	Date	Name	LG Electronics Inc.			DRAWING NO.	VER 1.0	

LG Electronics Inc.

9. PCB LAYOUT


G1610-BLUETOOTH-REV1.0-TOP
BAT100
U301
U302
U600
U400
U401
U100
U101
U200
U300
U201
U204
U203
U402
U403
CN500
CN601
CN602
J500
M1
Q301
Q500
D500
D100
X100
X400
FL400
SW400
OUT400
JTAG1
GND
JTAGEN
TDI
VBAT
RPWON
TDO_1
TMS
TCK
TDO_O
_F_WE

9. PCB LAYOUT


G1610-BLUETOOTH-REV1.0-BTM
CN200
CN600
TP601
TP600
KB511
KB500
KB504
KB509
KB514
KB519
KB515
KB510
KB521
KB520
KB501
KB503
KB508
KB513
KB518
KB505
KB506
KB516
KB502
KB507
KB512
KB517
MIC200
ANT1

10. ENGINEERING MODE

A. About Engineering Mode

Engineering mode is designed to allow a service man/engineer to view and test the basic functions provided by a handset.

B. Access Codes

The key sequence for switching the engineering mode on is 2945#*#. Pressing END will switch back to non-engineering mode operation.

C. Key Operation

Use Up and Down key to select a menu and press 'select' key to progress the test. Pressing 'back' key will switch back to the original test menu.

10.1 BB Test [MENU 1]

Baseband Test

A. LCD [1-1]

This menu is to test the LCD contrast.

- **Contrast Value [1-1-1]** : Change this value by up and down key.

B. Backlight [1-2]

This menu is to test the LCD Backlight and Keypad Backlight.

- **Backlight On [1-2-1]** : LCD Backlight and Keypad Backlight light on at the same time.
- **Backlight Off [1-2-2]** : LCD Backlight and Keypad Backlight light off at the same time.
- **Backlight value [1-2-3]** : This controls brightness of Backlight. When entering into the menu, the present backlight-value in the phone is displayed. Use Left / Right key to adjust the level of brightness. The value of the brightness set at last will be saved in the NVRAM.

C. Buzzer [1-3]

This menu is to test the melody sound.

- **Melody on [1-3-1]** : Melody sound is played through the speaker.
- **Melody off [1-3-1]** : Melody sound is off.

D. Vibrator [1-4]

This menu is to test the vibration mode.

- **Vibrator On [1-4-1]** : Vibration mode is on.
- **Vibrator Off [1-4-2]** : Vibration mode is off.

E. ADC (Analog to Digital Converter) [1-5]

This displays the value of each ADC.

- **MVBAT ADC (Main Voltage Battery ADC) [1-5-1]**
- **AUX ADC (Auxiliary ADC) [1-5-2]**
- **TEMPER ADC (Temperature ADC) [1-5-3]**

F. BATTERY [1-6]

• Bat Cal [1-6-1] :

This displays the value of Battery Calibration.
The following menus are displayed in order; BAT_LEV_4V, BAT_LEV_3_LIMIT, BAT_LEV_2_LIMIT, BAT_LEV_1_LIMIT, BAT_IDLE_LI MIT, BAT_INCALL_LIMIT, SHUT_DOWN_VOLTAGE, BAT_RECHARGE_LMT

• TEMP Cal [1-6-2] :

This displays the value of Temperature Calibration.
The following menus are displayed in order; TEMP_HIGH_LIMIT, TEMP_HIGH_RECHARGE_LMT, TEMP_LOW_RECHARGE_LMT, TEMP_LOW_LIMIT

G. Audio [1-7]

This is a menu for setting the control register of Voiceband Baseband Codec chip. Although the actual value can be written over, it returns to default value after switching off and on the phone.

- **VbControl1 [1-7-1]** : VbControl1 bit Register Value Setting
- **VbControl2 [1-7-2]** : VbControl2 bit Register Value Setting
- **VbControl3 [1-7-3]** : VbControl3 bit Register Value Setting
- **VbControl4 [1-7-4]** : VbControl4 bit Register Value Setting
- **VbControl5 [1-7-5]** : VbControl5 bit Register Value Setting
- **VbControl6 [1-7-6]** : VbControl6 bit Register Value Setting

H. DAI (Digital Audio Interface) [1-8]

This menu is to set the Digital Audio Interface Mode for Speech Transcoder and Acoustic testing.

- **DAI AUDIO [1-8-1]** : DAI audio mode
- **DAI UPLINK [1-8-2]** : Speech encoder test
- **DAI DOWNLINK [1-8-3]** : Speech decoder test
- **DAI OFF [1-8-4]** : DAI mode off

10.2 RF Test [MENU 2]

Radio Frequency Test

A. SAR Test [2-1]

This menu is to test the Specific Absorption Rate.

- **SAR Test On [2-1-1]** : Phone continuously process TX only. Call-setup equipment is not required.
- **SAR Test Off [2-1-2]** : TX process off

10.3 MF Mode [MENU 3]

This manufacturing mode is designed to do the baseband test automatically. Selecting this menu will process the test automatically, and phone displays the previous menu after completing the test.

A. All auto test [3-1]

LCD, LED, Backlight, Vibrator, Buzzer, and Key Pad are tested in order for a certain time.

B. Backlight [3-2]

LCD Backlight and LED Backlight are on for about 1.5 seconds at the same time, then off.

C. Buzzer [3-3]

This menu is to test the volume of Melody. It rings in the following sequence.
Volume 1, Volume 2, Volume 3, Volume 0 (mute), Volume 4, Volume 5.

D. Vibrator [3-4]

Vibrator is on for about 1.5 seconds.

E. LCD [3-5]

Main LCD screen resolution tests horizontally and vertically one by one and fills the screen.

F. Key pad [3-6]

When a pop-up message shows ‘Press Any Key’, you may press any keys including side keys, but not [Soft2 Key]. If the key is working properly, name of the key is displayed on the screen. Test will be completed in 15 minutes automatically and the screen displays the previous one.

10.4 Trace option [MENU 4]

This is NOT a necessary menu to be used by neither engineers nor users.

10.5 Call Timer [MENU 5]

A. All calls [5-1]

This displays total conversation time. User cannot reset this value.

B. Reset settings [5-2]

This resets total conversation time to this, [00:00:00].

10.6 Fact. Reset [MENU 6]

This Factory Reset menu is to format data block in the flash memory and this procedure set up the default value in data block.

10.7 S/W version [MENU 7]

This displays software version stored in the phone.

Attention

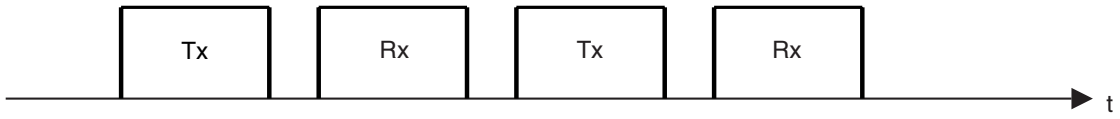
- Fact. Reset (i.e. Factory Reset) should be only used during the Manufacturing process.
- Servicemen should NOT progress this menu, otherwise some of valuable data such as Setting value, RF Calibration data, etc. cannot be restored again.

11. STAND ALONE TEST

11.1 What's the Standalone Test?

Set the Phone to Perform only Tx or Rx mode for monitoring performance of Tx part or Rx part only.

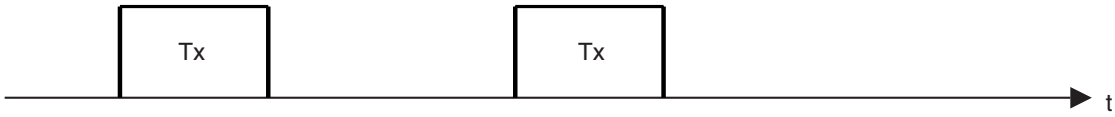
1. Normal Call



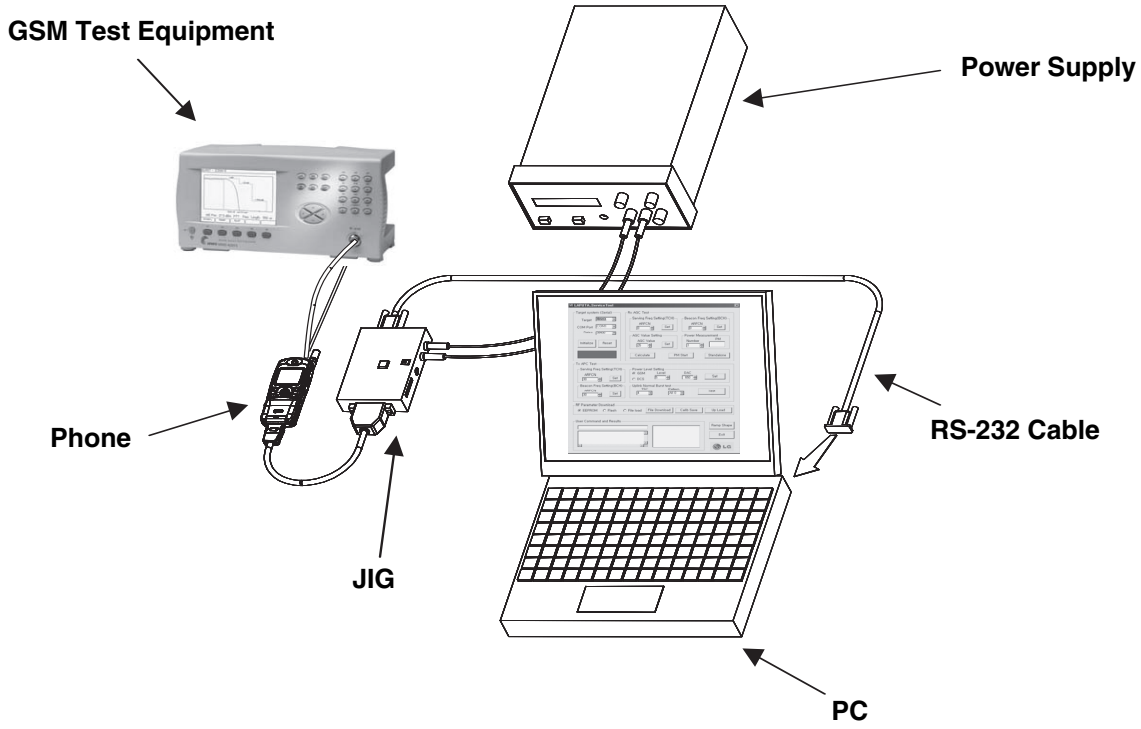
2. Standalone

• During Rx Standalone

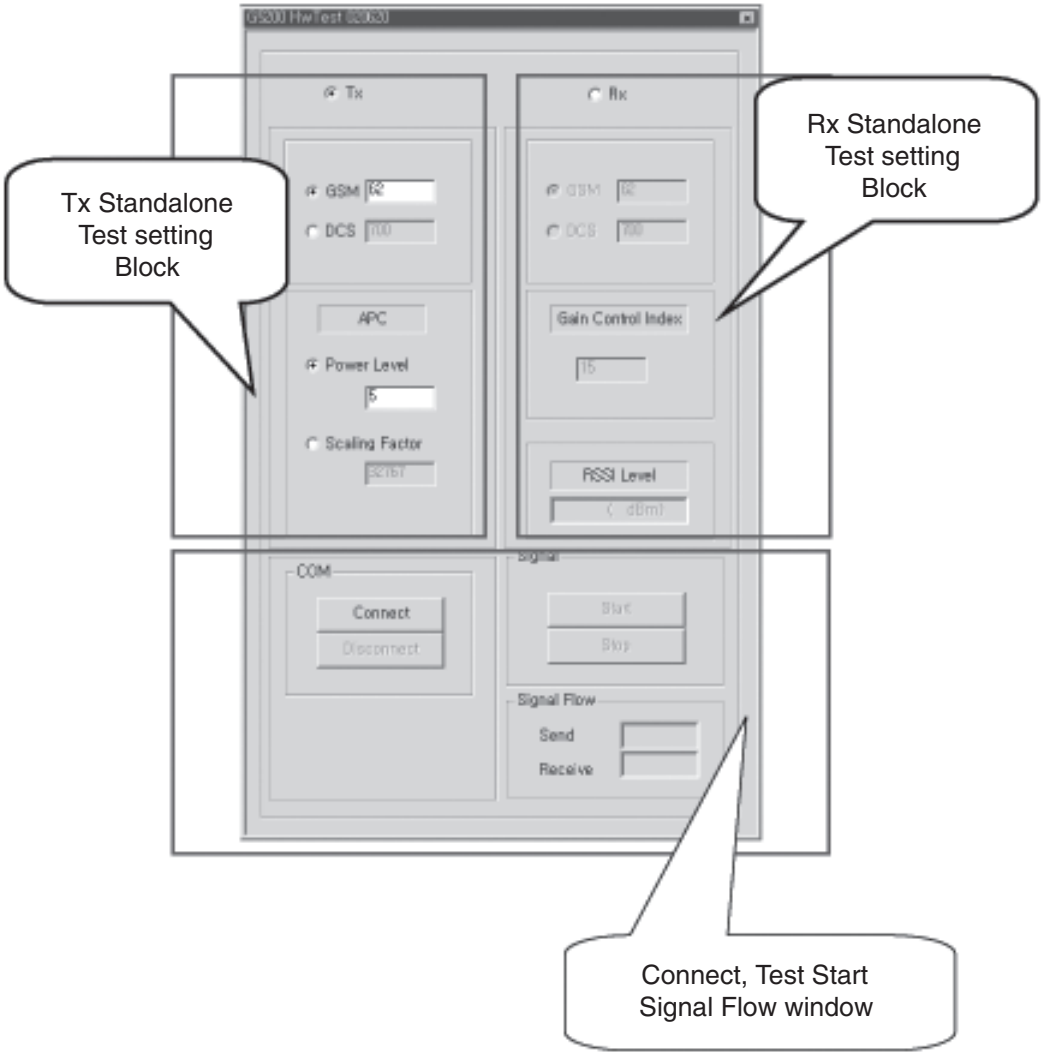
• During Tx Standalone



11.2 Standalone Test Equipment Setup



11.3 HW Test : Software for Standalone Test Setup



11.4 Tx Stand alone Test Setting

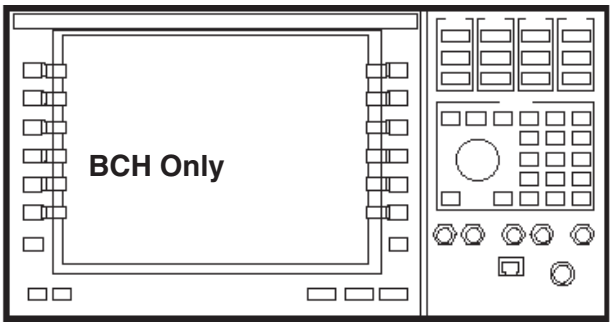
1. Setting the Test Equipment as 'Test Mode-BCH'

Example)
For HP8960
On the Control Window
Operating Mode : Test
Test Function : BCH

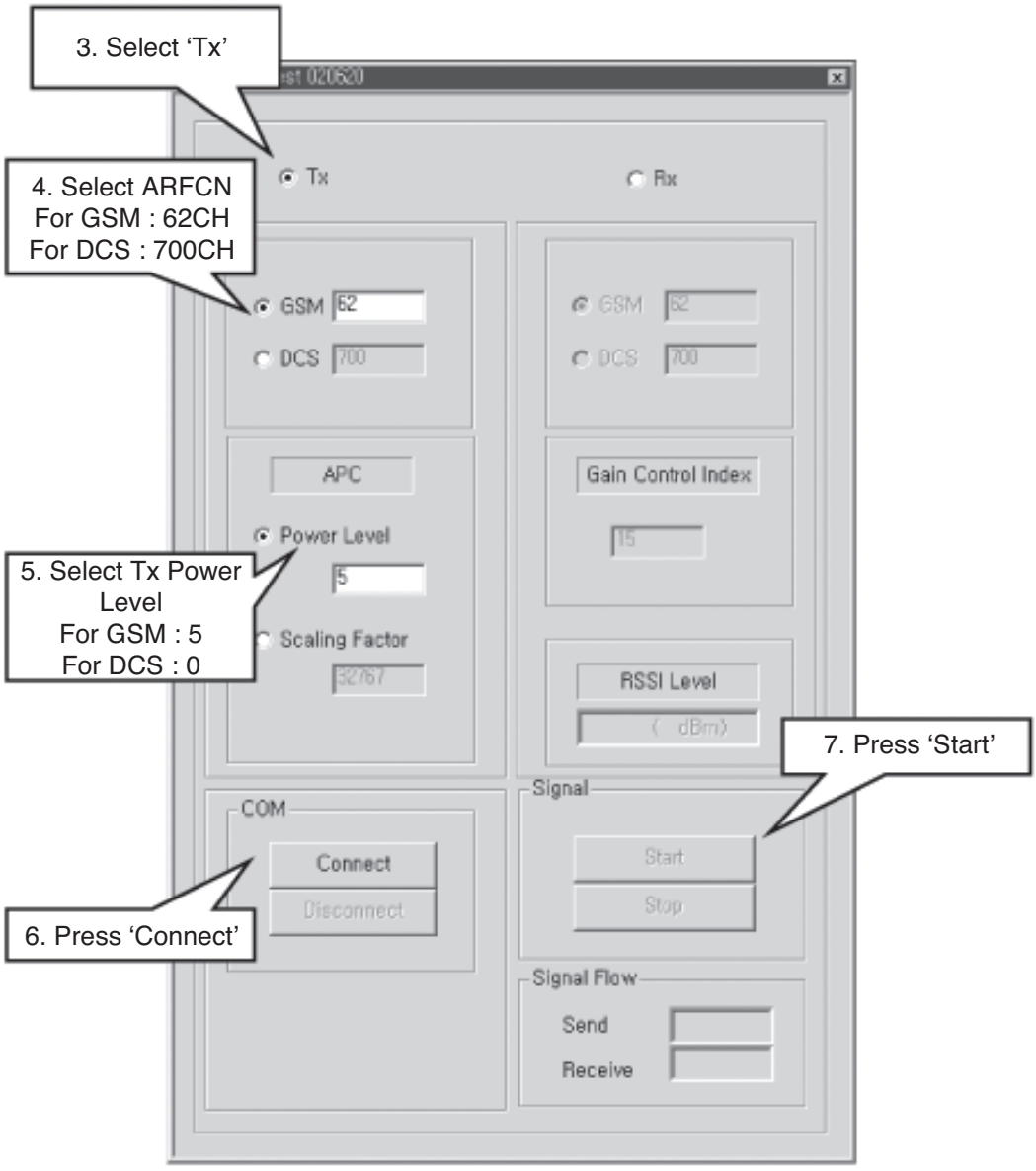
For HP8922
Operating mode : Test Mode

2. Setting Channel and Power

For GSM	For DCS
BCH : 62 CH TCH : 62 CH Tx Level : 5	BCH : 700 CH TCH : 700 CH Tx Level : 0



Tx Stand alone Test Setting



11.5 Rx Stand alone Test Setting

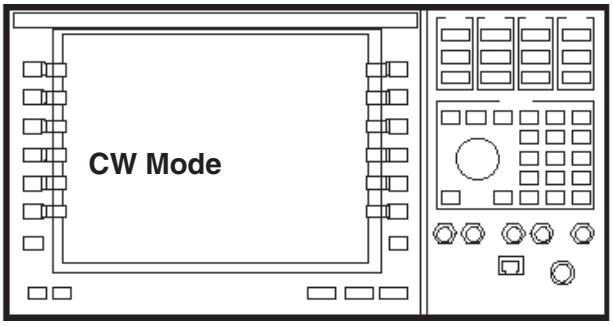
1. Setting the Test Equipment as 'CW MODE'

Example)
For HP8960
On the Control Window
Operating Mode : Test
Test Function : CW

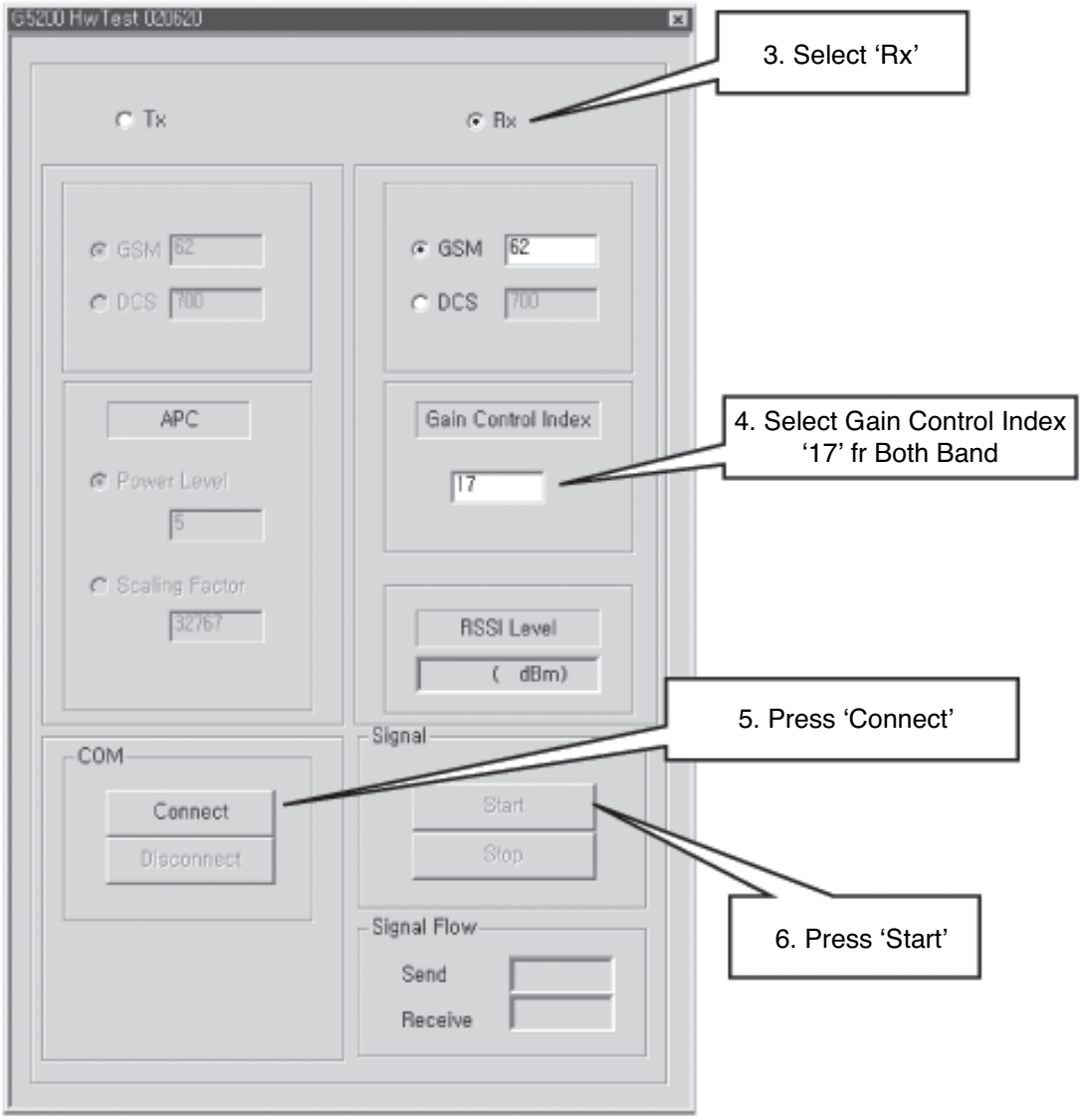
For HP8922
Operating mode : CW Generator

2. Setting Channel and Power

For GSM	For DCS
BCH : 62 CH TCH : 62 CH Tx Level : 5	BCH : 700 CH TCH : 700 CH Tx Level : 0



Rx Stand alone Test Setting



12. AUTO CALIBRATION

12.1 Overview

AutoCal (Auto Calibration) is the PC side calibration tool that performs Rx and Tx calibrationwith Agilent 8960 or other equipment. AutoCal generates calibration data by communicating with-phone and measuring equipment and writes it into calibration data block of flash memory inGSM phone. There are three steps for automatic gain control (AGC) for Rx, automatic powercontrol (APC) for Tx, and ADC control for monitoring battery voltage.

12.2 Equipment List

Equipment for Calibratio	Type/Mode	Band
Wireless Communication Test Set	HP-8960	Agilent
RS-232 Cable and Test JIG		LG
RF Cable		LG
Power Supply	Tektronix PS2521G II	Agilent
GPIO interface card	HP-GPIB	Agilent
Calibration & Final test software		LG
Test SIM Card		
PC (for Software Installation)	Pentium II class above 300MHz	

Table 12-1 Calibration Equipment List

12.3 Equipment Setup

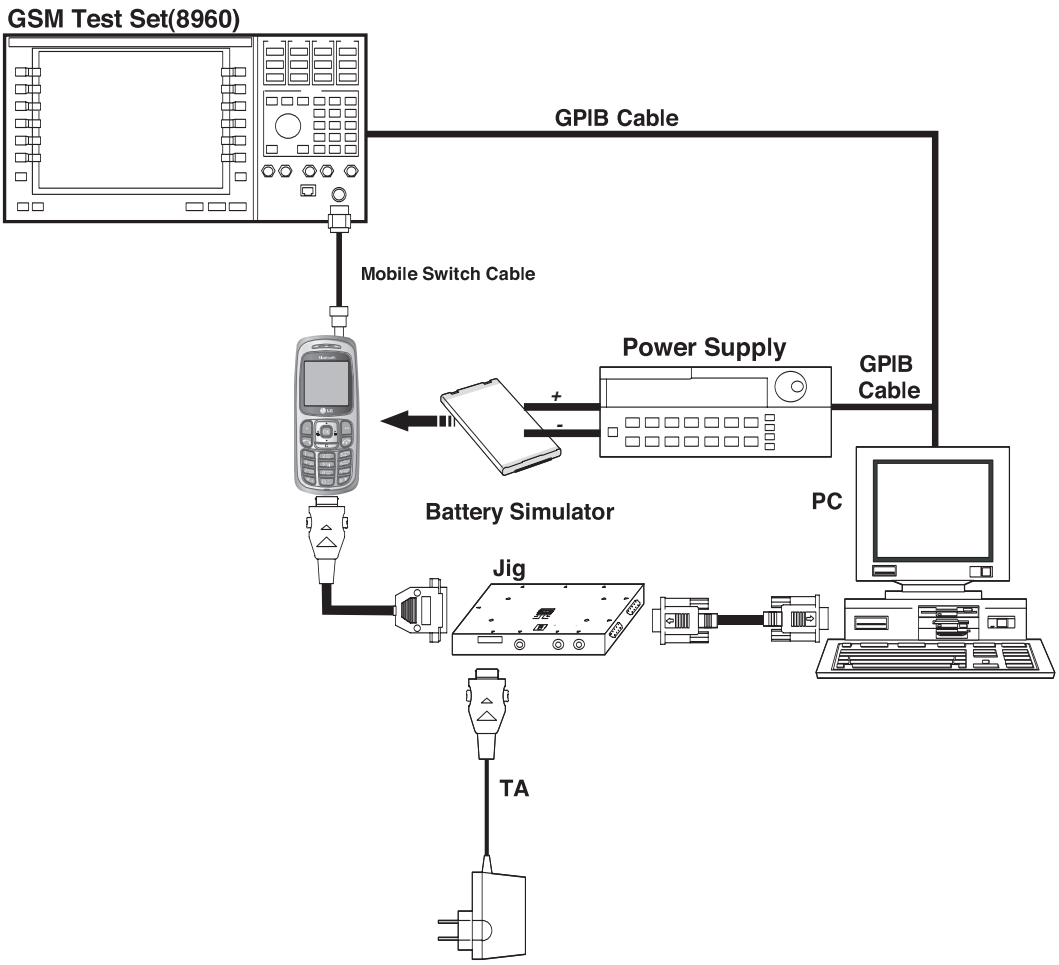
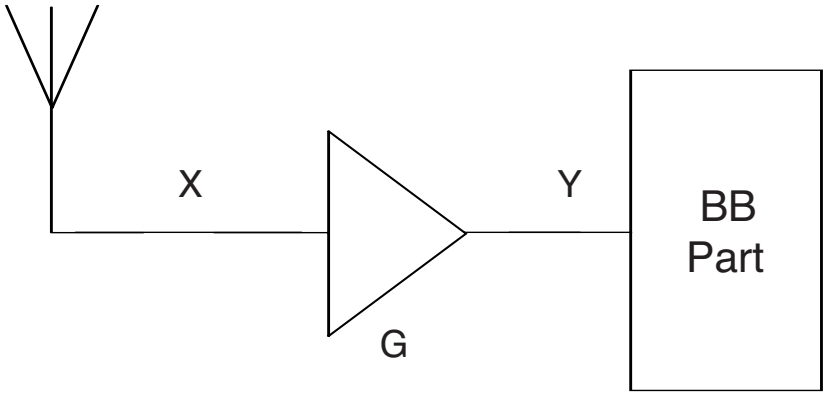


Figure 12-1 Equipment Setup

12.4 AGC fr RX

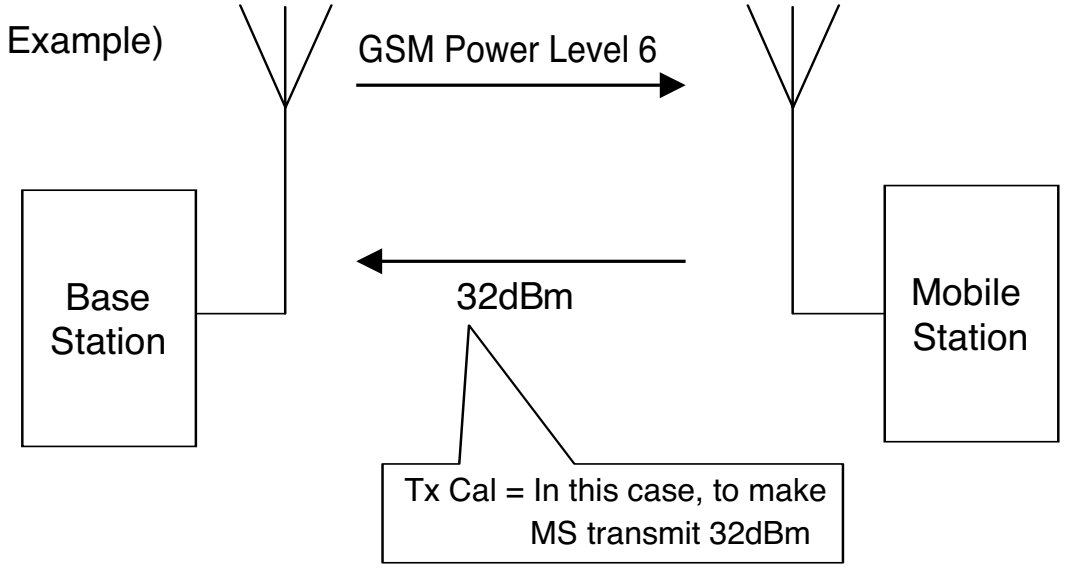
Setting the AGC Gain to make same Rx Power fed into the Base Band Part REgardless of Antenna Input level.



X (Input Level)+G (Gain)=Y

12.5 APC for TX

To make Tx Power Level transmitted properly following the information of Base Station.



12.6 ADC

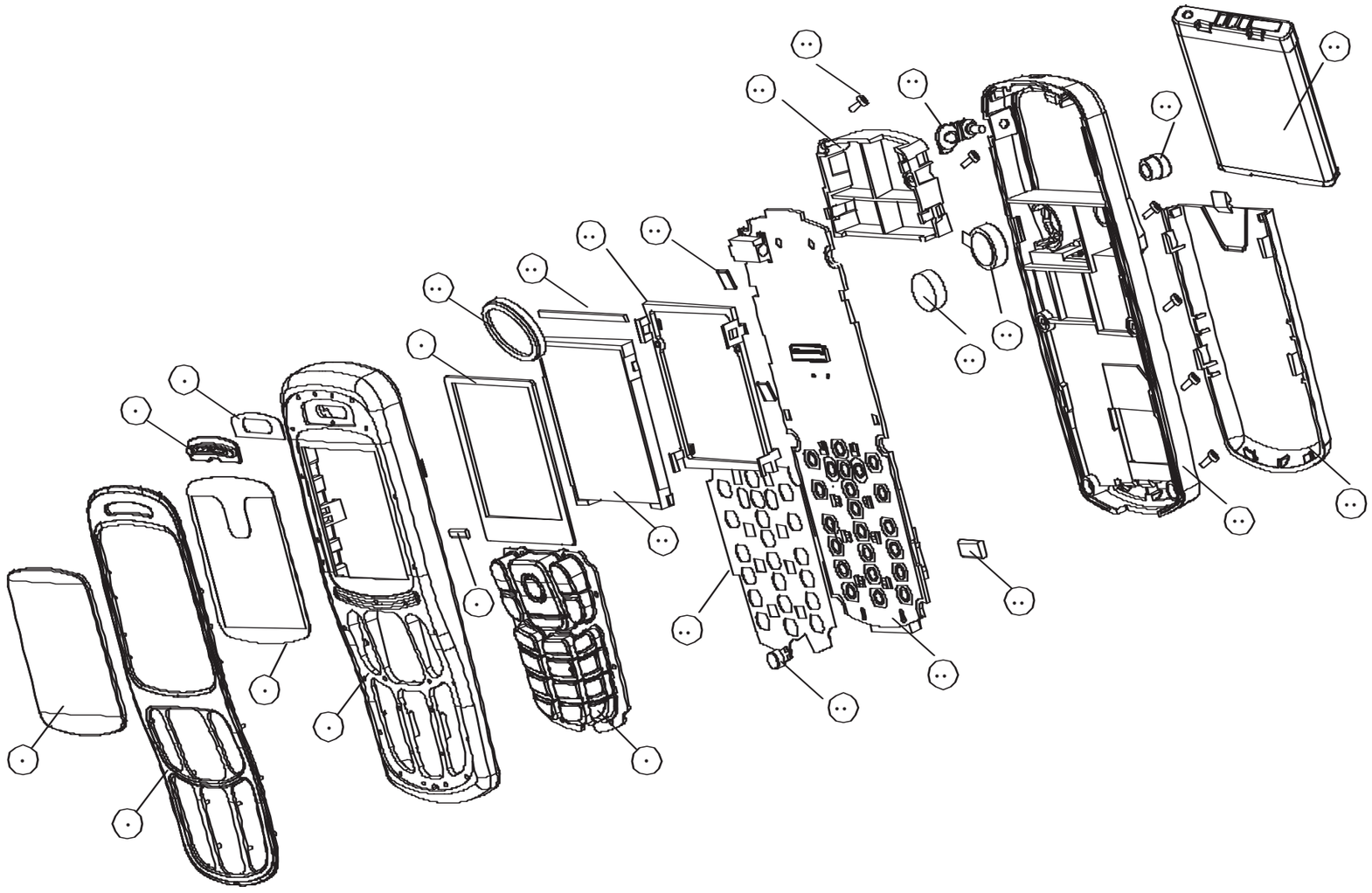
This procedure is for battery calibration.You can get mainBatteryConfigTable and temperatureConfigTable.

12.7 How to do calibration

A. Connect cable between phone and serial port of PC.
B. Connect Agilent 8960 equipment, programmable power supply, and phone.
C. Press Start button. AutoCal processes all calibration procedure
   i. AGC EGSM
   ii. AGC DCS
   iii. APC EGSM
   iv. APC DCS
   v. ADC

13. EXPLODED VIEW & REPLACEMENT

13.1 Exploded View



<Parts List of Exploded View>

26	BATTERY PACK,LI-ION	1	SBPL0072162
25	CAP,MOBILE SWITCH	1	MCCF0014201
24	COVER,BATTERY	1	MCJA0006401
23	COVER,REAR	1	MCJN0020401
22	SCREW,MACHINE	6	GMZZ0001901
21	CAP,EARPHONE JACK	1	MCCC0014001
20	VIBRATOR,MOTOR	1	SJMY0003603
19	PAD,MOTOR	1	MPBJ0020601
18	ANTENNA,GSM,FIXED	1	SNGF0003901
17	PCBASSY,MAIN	1	SAFY0119601
16	MICROPHONE	1	SUMY0003802
15	DOME ASSY,METAL	1	ADCA0027801
14	GASKET,SHIELD FORM	3	MGAD0049601
13	HOLDER,LCD		MHGD0002001
12	PAD,LCD	1	MPBG0019503
11	LCD	1	SVLY0018801
10	SPEAKER	1	SUSY0006214
9	PAD,LCD	1	MPBG0027701
8	KEYPAD,ASSY	1	AKAZ0007301
7	GASKET,SHIELD FORM	1	MGAD0073401
6	TAPE,DECO	1	MTAA0061901
5	DECO,RECEIVER	1	MDAH0010101
4	COVER,FRONT	1	MCJK0033301
3	TAPE,WINDOW	1	MTAD0030101
2	DECO,FRONT	1	MDAG0008201
1	WINDOW,LCD	1	MWAC0045901

13.2 Replacement Parts

Note: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

<Mechanic component>

Level	Location No.	Description	Part Number	Specification	Color	Remark
1		GSM,BAR/FILP	TGSM0030001	G1610 RUSRD	Red	
2	AAAY00	ADDITION	AAAY0062485		Blue	
3	MCJA00	COVER,BATTERY	MCJA0006404		Dark Blue	24
2	APEY00	PHONE	APEY0174901	G1610 RUSRD	Red	
3	ACGK00	COVER ASSY,FRONT	ACGK0044201			
4	ACGK00	COVER ASSY,FRONT	ACGK0044901			
5	MCJK00	COVER,FRONT	MCJK0033301		Blue	4
5	MDAG00	DECO,FRONT	MDAG0008201		Silver	2
5	MDAH00	DECO,RECEIVER	MDAH0010101			5
5	MGAD00	GASKET,SHIELD FORM	MGAD0073401			7
5	MICD00	INSERT,BAR	MICD0000201		Gold	
5	MPBG00	PAD,LCD	MPBG0027701			9
5	MTAA00	TAPE,DECO	MTAA0061901			6
5	MTAD00	TAPE,WINDOW	MTAD0030101			3
4	MTAB00	TAPE,PROTECTION	MTAB0042901			
4	SUSY00	SPEAKER	SUSY0006214	ASSY ,8 ohm,123 dB,2014 mm,3.6T		10
3	ACGM00	COVER ASSY,REAR	ACGM0044601			
4	ACGM00	COVER ASSY,REAR	ACGM0044501			
5	MCCC00	CAP,EARPHONE JACK	MCCC0014001		Silver	21
5	MCJN00	COVER,REAR	MCJN0020403		Dark Blue	23
5	MPBJ00	PAD,MOTOR	MPBJ0020601			19
5	MTAB00	TAPE,PROTECTION	MTAB0042902			
5	SJMY00	VIBRATOR,MOTOR	SJMY0003603	3.0 V,0.085 A,10*18 ,3.4T,C310,W/ CONNECTOR		20
4	MLAC00	LABEL,BARCODE	MLAC0003401	EZ LOOKS(user for mechanical)		
3	AKAZ00	KEYPAD ASSY	AKAZ0007301			8
3	GMZZ00	SCREW MACHINE	GMZZ0001901	1.4 mm,3.5 mm,MSWR3(BK) ,N ,STR ,- , t OF HEAD=1.0,DIA OF HEAD=3.1		22
3	MCCF00	CAP,MOBILE SWITCH	MCCF0014201	C3100 EUASV	Silver	25
3	MLAK00	LABEL,MODEL	MLAK0006301	LG (30.5x21.5 4-1R)	Pearl White	
4	ADCA00	DOME ASSY,METAL	ADCA0027801			15
4	MGAD00	GASKET,SHIELD FORM	MGAD0049601	C1300 CGRSV 4 x 8 x 1.5 t	Gold	14
4	MHGD00	HOLDER,LCD	MHGD0002001	C3100 EUASV		13
4	MPBG00	PAD,LCD	MPBG0019503	SWS 40P (30*3*0.7)	Black	12
4	MPBZ00	PAD	MPBZ0069201			

13.2 Replacement Parts

Note:This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC.

<Main Component>

Level	Location No.	Description	Part Number	Specification	Color	Remark
3	SAFY00	PCB ASSY,MAIN	SAFY0119601	G1610 BAR 900/1800MHz	Red	17
4	SAFA00	PCB ASSY,MAIN,AUTO	SAFA0046101	G1610 BAR 900/1800MHz	Red	
5	ANT1	ANTENNA,MOBILE,FIXED	SNMF0008702	0 ,0 dB,CF 3880MHz ,3216 1.2T ,BLUETOOTH CHIP		
5	BAT100	CONN,JACK/PLUG, EARPHONE	ENJE0003001	2 ,2 PIN,W3000 Back Up Battery Holder		
5	C100	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
5	C101	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
5	C102	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
5	C103	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
5	C104	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
5	C105	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
5	C106	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
5	C107	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
5	C108	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C109	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
5	C110	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
5	C111	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C112	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C113	CAP,CERAMIC,CHIP	ECCH0000276	1 uF,10V,Z,Y5V,HD,1608,R/TP		
5	C115	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C116	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C117	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C118	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C119	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C120	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C121	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
5	C122	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
5	C123	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
5	C150	CAP,CERAMIC,CHIP	ECCH0000167	0.1 uF,6.3V,K,X5R,HD,1005,R/TP		
5	C200	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C207	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C208	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
5	C210	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C211	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C212	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C216	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		

Level	Location No.	Description	Part Number	Specification	Color	Remark
5	C217	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP		
5	C219	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C220	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
5	C221	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C222	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C223	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C224	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP		
5	C225	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C226	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C227	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP		
5	C228	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
5	C229	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
5	C230	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
5	C231	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
5	C232	CAP,CERAMIC,CHIP	ECCH0000138	390 pF,50V,K,X7R,HD,1005,R/TP		
5	C233	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
5	C234	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
5	C235	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
5	C236	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
5	C237	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
5	C238	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
5	C239	CAP,CERAMIC,CHIP	ECCH0000379	2.2 uF,6.3V ,K ,X5R ,HD ,2012 ,R/TP		
5	C240	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
5	C241	CAP,CERAMIC,CHIP	ECCH0003803	4.7 uF,10V ,Z ,Y5V ,HD ,2012 ,R/TP		
5	C250	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP		
5	C251	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP		
5	C300	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
5	C301	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP		
5	C302	CAP,TANTAL,CHIP	ECTH0002001	10 uF,10V ,M ,STD ,2012 ,R/TP		
5	C303	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
5	C304	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
5	C305	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
5	C306	CAP,CERAMIC,CHIP	ECCH0000128	100 pF,50V,J,NP0,TC,1005,R/TP		
5	C307	CAP,CERAMIC,CHIP	ECCH0000128	100 pF,50V,J,NP0,TC,1005,R/TP		
5	C308	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
5	C309	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
5	C310	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
5	C311	CAP,CERAMIC,CHIP	ECCH0000280	0.22 uF,10V ,K ,X7R ,HD ,1608 ,R/TP		
5	C312	CAP,CERAMIC,CHIP	ECCH0005801	2.2 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		

Level	Location No.	Description	Part Number	Specification	Color	Remark
5	C313	CAP,CERAMIC,CHIP	ECCH0005801	2.2 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
5	C314	CAP,CERAMIC,CHIP	ECCH0000280	0.22 uF,10V ,K ,X7R ,HD ,1608 ,R/TP		
5	C315	CAP,CERAMIC,CHIP	ECCH0005801	2.2 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
5	C317	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
5	C318	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
5	C319	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C320	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C321	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C322	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C323	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C324	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C398	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C399	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C401	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
5	C402	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
5	C403	CAP,TANTAL,CHIP	ECTH0001701	10 uF,6.3V ,M ,L_ESR ,2012 ,R/TP		
5	C404	CAP,CERAMIC,CHIP	ECCH0000102	1 pF,50V,C,NP0,TC,1005,R/TP		
5	C405	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C406	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C407	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C408	CAP,CERAMIC,CHIP	ECCH0000128	100 pF,50V,J,NP0,TC,1005,R/TP		
5	C409	CAP,CERAMIC,CHIP	ECCH0000186	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
5	C410	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
5	C411	CAP,CERAMIC,CHIP	ECCH0000701	1.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
5	C413	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
5	C414	CAP,CERAMIC,CHIP	ECCH0000105	4 pF,50V,C,NP0,TC,1005,R/TP		
5	C415	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
5	C416	CAP,CERAMIC,CHIP	ECCH0000101	0.5 pF,50V,C,NP0,TC,1005,R/TP		
5	C417	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C418	CAP,CERAMIC,CHIP	ECCH0000179	22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP		
5	C419	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C420	CAP,CERAMIC,CHIP	ECCH0000102	1 pF,50V,C,NP0,TC,1005,R/TP		
5	C421	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C422	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C423	CAP,CERAMIC,CHIP	ECCH0000102	1 pF,50V,C,NP0,TC,1005,R/TP		
5	C424	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C425	CAP,CERAMIC,CHIP	ECCH0000102	1 pF,50V,C,NP0,TC,1005,R/TP		
5	C426	CAP,CERAMIC,CHIP	ECCH0000159	22 nF,16V,K,X7R,HD,1005,R/TP		
5	C427	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		

Level	Location No.	Description	Part Number	Specification	Color	Remark
5	C428	CAP,CERAMIC,CHIP	ECCH0000102	1 pF,50V,C,NP0,TC,1005,R/TP		
5	C429	CAP,CERAMIC,CHIP	ECCH0000128	100 pF,50V,J,NP0,TC,1005,R/TP		
5	C430	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
5	C431	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C432	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
5	C433	CAP,CERAMIC,CHIP	ECCH0000171	3.3 pF,16V ,J ,NP0 ,TC ,1005 ,R/TP		
5	C434	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
5	C435	CAP,CERAMIC,CHIP	ECCH0005801	2.2 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
5	C436	CAP,CERAMIC,CHIP	ECCH0003401	10 uF,6.3V ,Z ,Y5V ,HD ,2012 ,R/TP		
5	C437	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
5	C438	CAP,CERAMIC,CHIP	ECCH0003401	10 uF,6.3V ,Z ,Y5V ,HD ,2012 ,R/TP		
5	C500	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
5	C501	CAP,CERAMIC,CHIP	ECCH0001811	220000 pF,10V ,Z ,Y5V ,HD ,1005 ,R/TP		
5	C504	CAP,CERAMIC,CHIP	ECCH0004903	1 uF,6.3V ,Z ,Y5V ,TC ,1005 ,R/TP		
5	C600	CAP,CERAMIC,CHIP	ECCH0000167	0.1 uF,6.3V,K,X5R,HD,1005,R/TP		
5	C601	CAP,CERAMIC,CHIP	ECCH0004903	1 uF,6.3V ,Z ,Y5V ,TC ,1005 ,R/TP		
5	C602	CAP,CERAMIC,CHIP	ECCH0004903	1 uF,6.3V ,Z ,Y5V ,TC ,1005 ,R/TP		
5	C603	CAP,CERAMIC,CHIP	ECCH0004903	1 uF,6.3V ,Z ,Y5V ,TC ,1005 ,R/TP		
5	C604	CAP,CERAMIC,CHIP	ECCH0004903	1 uF,6.3V ,Z ,Y5V ,TC ,1005 ,R/TP		
5	C605	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C606	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C607	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C608	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C609	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C610	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C611	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C612	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C613	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C614	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C615	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C616	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C617	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C618	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C619	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C620	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C621	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C622	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C623	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C624	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		

13. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
5	C625	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C626	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C627	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C628	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C630	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP		
5	C631	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
5	C640	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C641	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C642	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C643	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C644	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C645	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C646	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C647	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C648	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C649	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C650	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C651	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C652	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C653	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C654	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C655	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C656	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C657	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C658	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C659	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
5	C663	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
5	C665	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
5	C666	CAP,CERAMIC,CHIP	ECCH0005801	2.2 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
5	C667	CAP,CERAMIC,CHIP	ECCH0005801	2.2 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
5	C668	CAP,CERAMIC,CHIP	ECCH0005801	2.2 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
5	C669	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
5	C670	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
5	CN500	CONNECTOR,BOARD TO BOARD	ENBY0001802	2 PIN,1.27 mm,STRAIGHT ,SILVER ,		
5	CN600	CONNECTOR,BOARD TO BOARD	ENBY0018701	41 PIN,0.3 mm,STRAIGHT , ,0.9t stacking height		
5	CN601	CONNECTOR,I/O	ENRY0000801	24 PIN,0.5 mm,ETC ,Au ,BAT ZERO		
5	CN602	CONNECTOR,ETC	ENZY0013002	3 PIN,3 mm,ETC ,AU ,BATTERY CONN.		
5	D100	DIODE,SWITCHING	EDSY0005701	EMT3 ,80 V,4 A,R/TP ,		

Level	Location No.	Description	Part Number	Specification	Color	Remark
5	R111	RES,CHIP	ERHY0000163	220K ohm,1/16W,F,1005,R/TP		
5	R112	RES,CHIP	ERHY0000106	100 ohm,1/16W,F,1005,R/TP		
5	R113	RES,CHIP	ERHY0000163	220K ohm,1/16W,F,1005,R/TP		
5	R114	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
5	R115	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R206	RES,CHIP	ERHY0000202	4.7 ohm,1/16W,J,1005,R/TP		
5	R207	RES,CHIP	ERHY0000202	4.7 ohm,1/16W,J,1005,R/TP		
5	R208	RES,CHIP	ERHY0000241	1K ohm,1/16W,J,1005,R/TP		
5	R209	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
5	R210	RES,CHIP	ERHY0000246	2K ohm,1/16W,J,1005,R/TP		
5	R211	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R212	RES,CHIP	ERHY0000247	2.2K ohm,1/16W,J,1005,R/TP		
5	R214	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R215	RES,CHIP	ERHY0000246	2K ohm,1/16W,J,1005,R/TP		
5	R216	RES,CHIP	ERHY0000296	1M ohm,1/16W,J,1005,R/TP		
5	R218	RES,CHIP	ERHY0000296	1M ohm,1/16W,J,1005,R/TP		
5	R219	RES,CHIP	ERHY0000250	3.3K ohm,1/16W,J,1005,R/TP		
5	R220	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R221	RES,CHIP	ERHY0006602	620 Kohm,1/16W ,J ,1005 ,R/TP		
5	R222	RES,CHIP	ERHY0006602	620 Kohm,1/16W ,J ,1005 ,R/TP		
5	R224	RES,CHIP	ERHY0000202	4.7 ohm,1/16W,J,1005,R/TP		
5	R225	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R226	RES,CHIP	ERHY0000202	4.7 ohm,1/16W,J,1005,R/TP		
5	R227	RES,CHIP	ERHY0000296	1M ohm,1/16W,J,1005,R/TP		
5	R229	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R230	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R231	RES,CHIP	ERHY0000138	33K ohm,1/16W,F,1005,R/TP		
5	R232	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
5	R233	RES,CHIP	ERHY0000278	82K ohm,1/16W,J,1005,R/TP		
5	R234	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R235	RES,CHIP	ERHY0000250	3.3K ohm,1/16W,J,1005,R/TP		
5	R236	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R237	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R238	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
5	R239	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R240	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R300	RES,CHIP	ERHY0001103	0.33 ohm,1/4W ,F ,2012 ,R/TP		
5	R301	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R302	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		

Level	Location No.	Description	Part Number	Specification	Color	Remark
5	R303	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
5	R304	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
5	R305	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R306	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R307	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R308	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R309	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R310	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R311	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
5	R312	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R313	RES,CHIP	ERHY0000244	1.5K ohm,1/16W,J,1005,R/TP		
5	R314	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
5	R315	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
5	R316	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R317	RES,CHIP	ERHY0000205	15 ohm,1/16W,J,1005,R/TP		
5	R398	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R399	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R400	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R401	RES,CHIP	ERHY0000263	15K ohm,1/16W,J,1005,R/TP		
5	R402	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R403	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R404	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R405	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R406	RES,CHIP	ERHY0004301	130 ohm,1/16W ,J ,1005 ,R/TP		
5	R407	RES,CHIP	ERHY0004301	130 ohm,1/16W ,J ,1005 ,R/TP		
5	R410	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R411	RES,CHIP	ERHY0006603	36 ohm,1/16W ,J ,1005 ,R/TP		
5	R412	RES,CHIP	ERHY0000223	150 ohm,1/16W,J,1005,R/TP		
5	R413	RES,CHIP	ERHY0000223	150 ohm,1/16W,J,1005,R/TP		
5	R414	RES,CHIP	ERHY0000263	15K ohm,1/16W,J,1005,R/TP		
5	R415	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R416	RES,CHIP	ERHY0000289	270K ohm,1/16W,J,1005,R/TP		
5	R417	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
5	R418	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R420	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
5	R500	RES,CHIP	ERHY0000205	15 ohm,1/16W,J,1005,R/TP		
5	R501	RES,CHIP	ERHY0000244	1.5K ohm,1/16W,J,1005,R/TP		
5	R502	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
5	R504	RES,CHIP	ERHY0000265	20K ohm,1/16W,J,1005,R/TP		

Level	Location No.	Description	Part Number	Specification	Color	Remark
5	R303	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
5	R304	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
5	R305	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R306	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R307	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R308	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R309	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R310	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R311	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
5	R312	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R313	RES,CHIP	ERHY0000244	1.5K ohm,1/16W,J,1005,R/TP		
5	R314	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
5	R315	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
5	R316	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R317	RES,CHIP	ERHY0000205	15 ohm,1/16W,J,1005,R/TP		
5	R398	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R399	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R400	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R401	RES,CHIP	ERHY0000263	15K ohm,1/16W,J,1005,R/TP		
5	R402	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R403	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R404	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R405	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R406	RES,CHIP	ERHY0004301	130 ohm,1/16W ,J ,1005 ,R/TP		
5	R407	RES,CHIP	ERHY0004301	130 ohm,1/16W ,J ,1005 ,R/TP		
5	R410	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R411	RES,CHIP	ERHY0006603	36 ohm,1/16W ,J ,1005 ,R/TP		
5	R412	RES,CHIP	ERHY0000223	150 ohm,1/16W,J,1005,R/TP		
5	R413	RES,CHIP	ERHY0000223	150 ohm,1/16W,J,1005,R/TP		
5	R414	RES,CHIP	ERHY0000263	15K ohm,1/16W,J,1005,R/TP		
5	R415	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R416	RES,CHIP	ERHY0000289	270K ohm,1/16W,J,1005,R/TP		
5	R417	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
5	R418	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R420	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
5	R500	RES,CHIP	ERHY0000205	15 ohm,1/16W,J,1005,R/TP		
5	R501	RES,CHIP	ERHY0000244	1.5K ohm,1/16W,J,1005,R/TP		
5	R502	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
5	R504	RES,CHIP	ERHY0000265	20K ohm,1/16W,J,1005,R/TP		

Level	Location No.	Description	Part Number	Specification	Color	Remark
5	R505	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
5	R506	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
5	R507	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
5	R508	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
5	R509	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
5	R510	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
5	R511	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
5	R512	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
5	R513	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
5	R514	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
5	R515	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
5	R600	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R601	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R602	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R603	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R604	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R605	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R606	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R607	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R608	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R610	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R611	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
5	R612	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R613	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R614	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R615	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R616	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R617	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R618	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R619	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R620	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R621	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
5	R622	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
5	R624	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
5	R625	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
5	R626	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
5	R627	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
5	R628	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
5	R629	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		

Level	Location No.	Description	Part Number	Specification	Color	Remark
5	R630	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
5	R632	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R633	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R634	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R636	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R637	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R638	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R639	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R641	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R642	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R643	INDUCTOR,CHIP	ELCH0005002	2.7 nH,S ,1005 ,R/TP ,		
5	R653	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R655	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R660	RES,CHIP	ERHY0000230	330 ohm,1/16W,J,1005,R/TP		
5	R661	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R662	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R663	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R664	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
5	R666	CAP,CERAMIC,CHIP	ECCH0000171	3.3 pF,16V ,J ,NP0 ,TC ,1005 ,R/TP		
5	R667	RES,CHIP	ERHY0000241	1K ohm,1/16W,J,1005,R/TP		
5	R668	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
5	SPFY00	PCB,MAIN	SPFY0093301	FR-4 ,1.0 mm,MULTI-8 ,	Red	
5	SW400	CONN,RF SWITCH	ENWY0003001	STRAIGHT ,SMD ,0.6 dB,3.8X3.0X3.6T		
5	U100	IC	EUSY0157001	LFBGA ,160 PIN,R/TP ,DIGITAL BASEBAND PROCESSOR		
5	U101	IC	EUSY0100701	64 BALL LFBGA / MINI-BGA ,64 PIN,R/TP ,DUAL-MODE VOICEBAND BASEBAND CODEC / AD20MSP430		
5	U200	IC	EUSY0098501	QFN ,32 PIN,R/TP ,		
5	U201	IC	EUSY0119001	10 uMAX ,10 PIN,R/TP ,DUAL SPDT ANALOG SWITCHES		
5	U202	IC	EUSY0122501	LLP-6 ,6 PIN,R/TP ,300mA CMOS LDO / 3.3V		
5	U203	IC	EUSY0077701	SC70-5 ,5 PIN,R/TP ,		
5	U204	IC	EUSY0077701	SC70-5 ,5 PIN,R/TP ,		
5	U300	IC	EUSY0145401	P-FBGA73 ,73 PIN,R/TP ,128M FLASH 32M PSRAM / BOTTOM BOOT / CE 2 PCS		
5	U301	IC	EUSY0145101	LFCSP-32 (5mmX5mm) ,32 PIN,R/TP ,2.8V LDO for Memory / GSM POWER MANAGEMENT SYSTEM		
5	U302	IC	EUSY0077301	SC70-6 ,6 PIN,R/TP ,SPDT Analog switch		
5	U400	PAM	SMPY0004001	35 dBm,53 %,50 mA,50 dBc,28 dB,10x7x1.4 ,SMD ,		
5	U401	IC	EUSY0161301	8x8 LGA ,28 PIN,R/TP ,		
5	U402	IC	EUSY0118602	SOT23 ,5 PIN,R/TP ,2.85V/150mA Low Noise uCap LDO Regulator		

13. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
5	U600	IC	EUSY0178201	TSOP JW12 ,12 PIN,R/TP ,Charge Pump For 4 White LED Driver		
5	U602	IC	EUSY0227901	SON5-P-0.35(fSV) ,5 PIN,R/TP ,2-INPUT AND GATE		
5	U603	IC	EUSY0223002	HVSOF5 ,5 PIN,R/TP ,150mA CMOS LDO WITH OUTPUT CONTROL / 2.8V		
5	U604	IC	EUSY0235001	Microbump-10 ,10 PIN,R/TP ,Dual SPDT Analog Switch (USB 1.1)		
5	VA200	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR		
5	VA201	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR		
5	VA202	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR		
5	VA203	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR		
5	VA204	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR		
5	VA205	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR		
5	VA206	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR		
5	VA500	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR		
5	VA600	VARISTOR	SEVY0000702	14 V,10% ,SMD ,		
5	VA601	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR		
5	X100	X-TAL	EXXY0004601	.032768 MHz,20 PPM,7 pF,65000 ohm,SMD ,6.9*1.4*1.3 ,		
5	X400	VCTCXO	EXSK0003501	13 MHz,2.5 PPM,10 pF,SMD ,5.0*3.2*1.5 ,		
4	SBCL00	BATTERY,CELL,LITHIUM	SBCL0001302	2 V,1 mAh,COIN ,W3000 Back Up Battery		
4	SUMY00	MICROPHONE	SUMY0003802	FPCB ,-42 dB,4*1.5 ,		16
4	SVLY00	LCD	SVLY0018801	128x128 ,35.78x39.7 ,65K CSTN, S6B33B2, TM		11
3	SNGF00	ANTENNA,GSM,FIXED	SNGF0003901	3.0 ,-2.0 dBd,WHITE ,GSM+DCS,C310,INTENNA		18

13.3 Accessory

Note:This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC.

Level	Location No.	Description	Part Number	Specification	Color	Remark
3	MHBY00	HANDSTRAP	MHBY0000404	Hand Strap 135mm	Black	
3	SBPL00	BATTERY PACK,LI-ION	SBPL0072126	3.7 V,950 mAh,1 CELL,PRISMATIC ,C310,T510 INNERPACK BATTERY	Silver	26
3	SSAD00	ADAPTOR,AC-DC	SSAD0007828	100-240V ,60 Hz,5.2 V,800 mA,CE,CB,GOST ,EU PLUG(24P),STD		
3	WSYY00	SOFTWARE	WSYY0190401	G1610 P16-07-ESV009-Dec 08 2004		